

Radio Control CAR ACTION

THE WORLD'S LEADING R/C CAR MAGAZINE



9 TRUCK BUDGET BASH!

Which delivers the most for your buck?

FIRST TEST!
Losi 4WD

XX-4

American Dream
Machine



**TRUCK
OF THE
YEAR**

—page 98

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BUILDING TIPS DO IT RIGHT, DO IT ONCE

RS4 CONVERSION TURNING "PRO"



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Radio Control **CAR ACTION**

VOLUME 12, NUMBER 8 • AUGUST 1997

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ON THE COVER (from top to bottom): homebuilt nitro-powered drag truck (photo by Walter Sidas); action from the Budget Race-Truck Shootout (photo by John Howell); Team Losi's XX-4 (photo by John Howell).

THIS PAGE (top to bottom): Team Losi's XX-4 reviewed (photo by Walter Sidas); action from the Budget Race-Truck Shootout (photo by Walter Sidas); Kyosho World Cup (photo by Chris Chianelli); Team Losi's Double-XT 'CR' Truck of the Year (photo by John Howell).

We must all start somewhere.

Fortunately, for today's R/C beginners, entry-level kits are of a substantially higher quality than those of the past. In few areas is this more evident than with off-road trucks—one of the hobby's most popular segments. But with so many kits from which to choose, and new ones seemingly being introduced each month, how do you figure out which one belongs in your R/C garage?

To solve this puzzle, we gathered nine of the best entry-level trucks and four *Car Action* editors and headed to the track and to the yard (where most folks run their trucks) to see which would stand out from the crowd. Among the many interesting revelations during testing was our discovery that there are sub-categories within the budget-truck category. Some trucks may truly be raced competitively, while others are better suited to informal activity of the grass-and-gravel variety.

When the dust had settled, we had emerged with three distinct groups of budget trucks—and three trucks that, through exceptional quality, performance or price, had distanced themselves from the pack.

Even if you're quite beyond being a beginner, we urge you to take a look at the "Budget Race Truck Shootout." One of these trucks just might take you into the winners' circle at your next club race.

■ You've undoubtedly heard much hoopla about the release of Losi's new XX-4 buggy. But now that it has finally found its way into the eager hands of racers, the question still remains: will we see more 4WD cars at the track? Surely, placing the responsibility for the resurgence of an entire racing class on the shoulders of one kit is a bit unfair, but if you spend time behind the wheel of a XX-4, your faith grows.

We spent the past five weeks racing and wrenching with the XX-4, and we can report that our hopes for this burgeoning 4WD class have not diminished. Is four-wheel-drive off-road really back? Read our review of the new Team Losi XX-4, then you be the judge.

■ If you were to ask us what will be the next "big thing" to hit the hobby, our answer might surprise you: gas sedans! Several companies have released promising new kits; however, if you really want to see what gas sedans are about, you must read Chris Chianelli's report on the Kyosho World Cup. Held in the exotic Philippines, the World Cup stems from the company that started the whole nitro-powered sedan movement. The weather was beautiful, the track was beautiful, the cars (Kyosho's vintage Nostalgic cars) were beautiful, and according to Chris, the women weren't too shabby either!



Left to right:
truck testers
Gonzalez,
Howell, Masi
and Chianelli.

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Radio Control CAR ACTION

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Brothers and Buggies

Your magazine kicks @\$\$.

My 8-year-old brother would like to get an R/C car. He likes the Traxxas Bandit, but I am not sure whether it would be a good car for him. How can I convince him to get it, or help change his mind if you wouldn't recommend it for a first-time modeler? Can you recommend another car? He doesn't have all that much money so he can't get an XX-4 (his dream car). He wants one that he can upgrade so he "stands a chance" against my B2—yeah, right! I live in San Francisco and am very surprised that there aren't any tracks in the city, so I only get to go to a track occasionally. Most of the time, I have to race my friends in local parks. I can't start my own track because I am still going through school. Is there any way that my friends and I could "encourage" someone to build a track? I feel that I am missing a lot without a track.

BEN STEWART
via email

Well, Ben, I think the Traxxas Bandit is a very good choice for a first-timer. It's a durable and reliable entry-level buggy that you can hop up as your skills and budget allow. I also recommend that your brother take a look at the relatively inexpensive Associated B2 Sport, since he'll eventually be trying to keep up with your B2. Though it might cost

slightly more than the Bandit, you guys will be able to share setups, and if one of you breaks a part, the other might have a spare, and so on and so on.

As for your track dilemma, look back to our January '95 issue; inside, you'll find an article entitled "How to Build Your Own Track." It contains hints on starting a club, ideas on track layout, tips on getting "the city" involved and so forth. Good luck with getting something going in your area.

Doogie

B2 Sport. Is it all that?

Is the B2 Sport really what you say it is? Did you find anything wrong with it? Does Futaba's 3003 servo have enough oz.-in. of torque to steer it in a race?

BPSHALL
via email

Well, I honestly can't say that I found anything wrong with the B2 Sport. If you plan to race it (in the stock class—the included speed control won't handle a mod motor) the only change I'd recommend would be to swap the tires for whichever treads work at your track. Other than that, go out and have fun with it. Eventually, you might want to consider upgrading it with a set of ball bearings and possibly an ESC as well. As for your Futaba inquiry: yes, the 3003 easily has enough torque to turn the Sport's wheel. You might want to consider getting the dual-ball-bearing kit for the servo so it centers properly and tracks more smoothly.

Doogie

Gas Breakdown

I read your article in *Car Action*, June 1996, on the Team Losi GTX, and I bought it shortly afterward. I think it is pretty cool, but I put a Thunder Tiger .15 pull-start engine in it (part no. 9413 PRO-15BZX ABC-R/C) and have had nothing but trouble. In one week, the pull-starter has been

repaired six times. It seems that the spring inside the pull-starter is slipping or vibrating loose. Do you have any suggestions? Is there a starter box to fit my truck? Is this a good motor, or should I get a different one? Is it OK to put Loctite on the low-end needle because it keeps on vibrating loose? Thanks for your help.

PAT ROWAN
via email

Have you told Thunder Tiger about your engine difficulties? I have run Thunder Tiger engines and have seen plenty of others in action and have never seen any problems with them; in fact, Thunder Tiger engines are well-known on the gas racing scene as very reliable powerplants. Give them a shout and let them know what's going on. I'm sure they'll be glad to help you get up and running and trouble-free. As for your starter-box question, contact Horizon and ask about the starter box they designed specifically for 1/10-scale gas trucks. Serpent also makes a similar starter box that was designed to fit the GTX. Again, contact Thunder Tiger about the low-end needle coming loose; it shouldn't be. And you definitely don't want to "Loctite" it in place. If you need to adjust it later, you won't be able to budge it.

Doogie

Diesel Powered Monster

G-Man—AWESOME Nitro Stampede!! I've done most of the hop-ups you did. Just one question: would a pull-start CZ-R that has been converted to diesel fit the truck? Would it haul butt? Great job; keep up the good work.

Jennie McDowell
via email

Jennie, glad you liked my truck. Sounds as if yours is just as awesome. You can bolt the O.S. CZ-R pull-start engine right onto the Nitro

Stampede without making any modifications. I don't have too much experience with diesel engines, so I called contributing author Greg Vogel because he has extensive knowledge of diesels. He says that a truck equipped with a diesel head will have more torque and higher top speeds than the stock TRX-12. In addition, the diesel engine will yield longer run times.

George

Those Darn Kids

I have a question for ya. My O.S. 12 CZ-R somehow got into my son's hands and he got creative with it. Fortunately, he didn't manage to damage or break any of the parts, but all three needles are out of whack. I can't even start it, and no one seems able to help me. Its manufacturer told me to mail the engine in for repair, but it isn't broken—just adjusted wrong. Can you help a desperate newcomer to the hobby?

MARK KINSLOW
via email

Hey, Mark, how old is your son? He must be good with tools because it's impossible to adjust the low-end needle and idle stop screw without tools. Enroll him in piano lessons right away; you might have the next Beethoven on your hands!

Here are the factory settings for your O.S. CZ-R: close the low-end needle valve all the way, then open it 1 1/2 turns; set the idle stop screw so the carb opening (at neutral) is open 1.5mm (use the tip of an L-shaped, 1.5mm Allen wrench to set the idle stop); the high-end needle should be anywhere from two to three turns open. The best high-end setting will vary considerably according to weather, altitude and many other variables, but your engine should start as long as you set the high needle as recommended. And be sure to install a new glow plug before you try to start the engine.

George

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

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In search of fun
and glory, 'cause
life's too short
to be a sheep • by Chris Chianelli

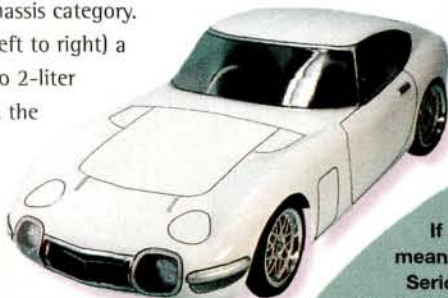
INSIDE scoop



Sunrise Bodies

Just thought I'd show you some unique bodies unavailable anywhere else. First, we have three classic oldies in the minicar or "M"-chassis category.

They are (above, left to right) a Lotus Elan, an Alfa Romeo 2-liter sedan and a '50s favorite, the Porsche Speedster. Next, we have a 1/10-scale Lexus LS400 RS (far right) for the *nouveau riche* racer, and last, we



have my favorite (above and right): a 1/10-scale ... wait a minute, I'm not going to tell what that awesome looking GT is—so there. Instead, the first reader to give me a correct answer via snail mail will win a subscription to *Car Action*. The winner will be announced in "Chris's Back Lot." For more information, contact Sunrise R/C Ltd., 1703 Utah Ct., Milton, WA 98354; (888) 874-8508 (toll-free); fax (206) 838-7603.

Oh yes, Sunrise won't give out the answer until I tell them I have a winner, so don't get any cute ideas HAH! I control everything!!!!



At last, a company named a product after ME!! No, wait; that's not right! If it's named after me, it should be *Super Hair*; no, I mean, *Super Hair Brain*. Yeah, that's it!!

Seriously, though, if the Super Brain 809 charger does everything that MRC claims it does, it's the bargain of the century. Don't have the equipment to monitor your battery while charging? Do you want to avoid that horror of horrors—DUMPING!!—because your battery was only partially charged, and you didn't know it? Do you want to get the optimum charge without frying your pack? Then this unit should be on your shopping list under the "For serious consideration" heading. The unit is a Delta-peak, AC/DC quick charger that comes with both 2A and 4A charge modes, automatic 2-hour trickle-charge mode and fused protection for optimum safety. But the really cool part is the "fuzzy-logic" intelligence. The Super Brain's microprocessor assesses the type of battery being charged—whether an old sport pack or a brand-new, top-of-the-line, matched-cell pack—then adjusts itself to charge at whatever rate that pack can safely handle without overheating. The processor constantly monitors the charge level for maximum capacity charge. It's

designed for 7.2V and 8.4V packs, and yes, I'm told that 2000mAh packs are no problem. All this is available for a suggested retail price of \$49.95, which means you, the consumer, will be able to get it for around \$35 to \$40! If production versions live up to this price and performance, I'll be impressed. For more information, contact Model Rectifier Corp., 80 Newfield Ave., Edison, NJ 08837-3817; (908) 225-2100.

The Super Brain



INSIDE scoop

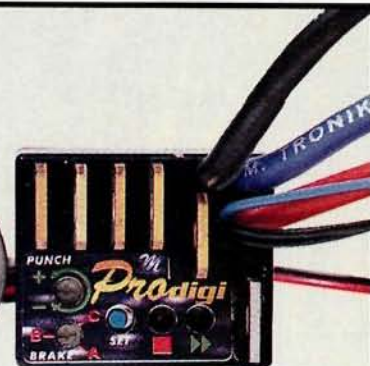
Style & Performance



Pro-Line's new Eliminator Spoke 2.2-inch truck wheels are for R/C'ers who want to add sharp looks and performance to their Associated T2 or Losi XXT 'CR' trucks. These new, light wheels are molded in both dyeable white nylon and neon yellow. They are an exact fit for the T2 and the XXT 'CR' trucks and are available in two styles: 2.2-inch wheels for rubber off-road tires, or with mounted and trued foam tires. For more information, contact Pro-Line, 201 W. Lincoln St., Banning, CA 92223; (909) 849-9781; fax (909) 849-2968.

**Hot
things
come in
little
packages**

Ever have a hard time fitting all the electronics into a cramped chassis? M.troniks' new Prodigy, which measures only $1\frac{3}{16} \times 1 \times \frac{5}{8}$ inches, does a lot to solve this problem. With this little package, however, you sacrifice nothing. The Prodigy features microprocessor-based technology; push-button setup with M.troniks' Pro-Touch™ system; infinite resolution; current-control system; sonic, bipolar FET drive system; state-of-the-art power MOSFETS; and exclusive M.troniks-adaptive Punch-Control™. You see, hot things *do* come in tiny packages. For more information, contact Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-6875.



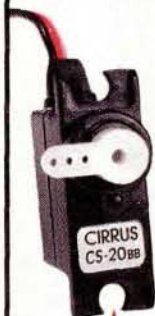
TRINITY

ZERO

\$3.99

Our 128
Tooth Spur
Is Lighter Than
Most 100 Tooth
Spur Gears!

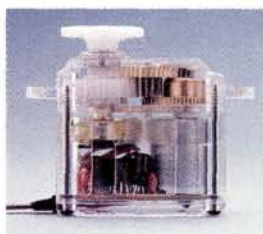
World's Smallest Servo...



actual size

... according to Global Hobbies. I thought you "home-grown" fanatics, who like to put all kinds of functional stuff on your scratch-built projects, might be interested in this minuscule servo, and perhaps the rest of you guys would like to see the latest item production lines are turning out in the micro-electronics arena. Global Hobbies touts its new Cirrus CS-20 Ball Bearing Sub-Servo as the smallest, lightest, most compact microservo available. Imagine the possibilities! Specs: dimensions—0.86x0.43x0.83 inches; weight—0.32 ounces; speed at 4.8 volts—0.11 second/60 degrees; and torque at 4.8 volts—11.11 oz.-in. It's available with Futaba, Airtronics, or JR/Hitec connectors. For more information, contact Global Hobbies, 18480 Bandilier Cir., Fountain Valley, CA 92728-8610; (714) 964-0827; fax (714) 962-6452.

Also from Cirrus: the high-torque (129.86 ounces at 6 volts) CS-80 metal gear. The cost is only \$22.99! Yes, it really does have a clear case.



not actual size

Gauging for performance

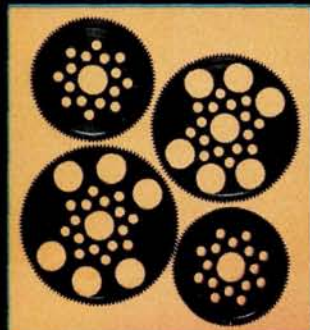
I'm sure I don't have to tell any of you that toe-in and camber drastically affect handling performance. Stop and think about it: just how accurately do you think you can make incremental changes on the all-important suspension geometry simply by "eyeballing" the necessary single-digit changes in degree angles? It would be kind of like trying to adjust the sensitive needle valve on a gas car with a freshly charged electric screwdriver! I'm sure you get my point.

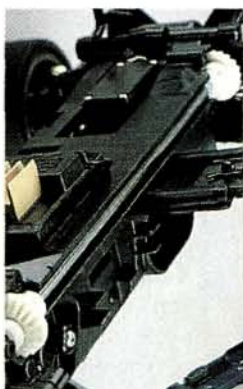
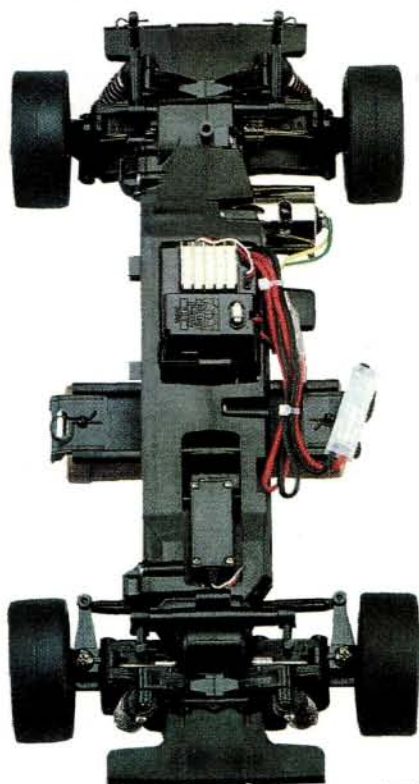
Now, RACEtech offer a version of their proven Off-Road Camber/Toe-in Gauge specifically designed for touring cars that have 12mm hex wheel adapters. If you want to "dial in" your touring car scientifically, this inexpensive item could be the single best investment you ever make. For more info, contact RACEtech Motor Sports, 4200 Sarpy Ave., St. Louis, MO 63110; (314) 531-3003; fax (314) 531-5678.



FRICTION SUPER GEARS™

- New Super Low Drag Narrow Tooth Design•
- Graphite Filled For High Tooth Strength•
- Super True, Super Light, Super Quiet•
- 84 & 87 Tooth Sizes For Losi XX-CR & XXT-CR•
- 95, 100, 120, & 128 Tooth For On-road Racing•
- Dual Diff Ball Holes For Stealth & Corally Diffs•

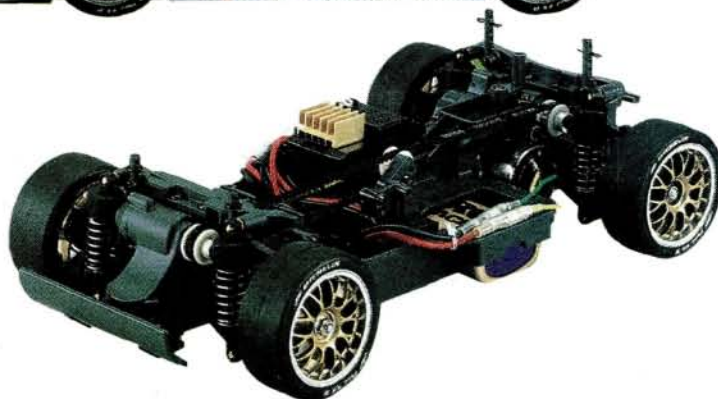




TLO1 Econo-Tour

One of the leading electric touring car manufacturers, Tamiya, introduce their new, budget, 4WD, mid/rear-motor sedan chassis, the TLO1 (above). In the pictures, it appears that the chassis and drive shaft housing are molded as a unit. I guess this interesting design is both simpler and less expensive to produce, and it should also provide a rigid foundation on which to hang the suspension assemblies. I wouldn't be surprised if the TLO1 delivers unexpected efficiency in the dollars-to-performance ratio department—my favorite department of all!

Also shown from the precision molding "cast-masters" of Shizuoka, Japan, is the new TAO3RS (below), which also has a mid/rear motor but which is basically at the price point of a TAO3. We'll soon have more—much more—on the TLO1 and the TAO3RS.



KO Mars

KO Propo's new EX-1 Mars radio definitely falls into the "super-system" category; it will meet the needs of even the most demanding drivers. Let me start with system-level matching, one of the incredible new features of the EX-1 Mars. The system-level feature matches the user's skill level to the number of programming functions available in the menu, from level 1 for basic operation to level 4 for access to all features. Other innovative functions include settings data storage, with instant recall in case the wrong data are input; steering-speed adjustment (individually in both directions) at transmitter; throttle speed also adjustable at transmitter; an active braking system that helps to stabilize the car and increase its speed during cornering; direct set feature that cues the LCD to automatically display the menu related to the trim lever or grip dial that's being adjusted; and 10-model memory storage. For more information, contact Great Planes Model Distributors, 2904 Research Rd., Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-0008.

"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. If we choose to feature your creation, you'll receive a 6-month subscription to Car Action, or an extension of your existing subscription. You'll also be eligible for the seventh annual "Readers' Rides of the Year Contest" in the fall of 1997. The winner will be awarded \$500 and an assortment of electronic R/C equipment furnished by Novak Electronics Inc. Our second and third choices will also receive an assortment of Novak Electronics R/C equipment. In case we need to contact you, write your address and phone number on your letter and on the back of every photo you send. Good luck!

Every day, we open envelope after envelope stuffed with your pictures and stories. Most submit a letter with a photo or two; others take an unconventional approach and send full-blown action shots. Perhaps because scale size is so seldom in question, we get very few pictures of the driver/builder with his/her car. Occasionally, though, we do collect a few. So we gathered the conventional and the unconventional and put together this special edition of "Readers' Rides."



EVERYDAY EVENT

Tony Perrone of Agua Dulce, CA, is one dedicated enthusiast. He has built a 200-square-foot "pit shop" in his home, and $\frac{2}{3}$ of an acre of his yard is used as an off-road clay track. His ESP Clodzilla runs with Trinity 16T motors and a 7-cell Sanyo 2000mAh matched pack. Tony has equipped the truck with Deans Ultra Plugs and wire, complete ball bearings, Losi shocks and chrome wheels with Pro-Line Giant Track tires. His Losi Double-Xt 'CR' is powered by a Kinwald 11-turn quad motor with

"R" brushes. Other mods include an aluminum top shaft, titanium-nitride shock shafts, aluminum screws, titanium pins, rods and ball ends, as well as MIP's shiny CVDs, RPM cushioned bumper and Losi tires front and rear. His Double-X 'CR' runs with a Kinwald 13T motor and upgrades similar to those on the Double-Xt 'CR.' With great rides like this, it's no wonder he gets behind the wheel of his Futaba radio gear every day!



CONFIDENT COMPETITOR

According to Barry Tom of Reinholds, PA, his six-year-old son, Michael, has become "quite the R/C enthusiast." His Kyosho MP-5 is powered by an O.S. .21 RZ-B engine and is equipped with MIP CVDs and a steel main gear. It is controlled by Futaba S9303 servos and a 3PDF transmitter. With a cool-looking and great-running ride like this, Michael is surely the hit of the schoolyard!

TEAM PINK

When the Dunlap family—Jim, Kim, Shaun and Tiffany—of Portland, OR, decided to get into R/C racing, they jumped in with all eight feet. They started out with three Associated RC10Ts, which Kim, Shaun and Tiffany raced for the first time in April 1996 with the Competition Racing Association. Jim pitted for the team until Kim purchased a new truck and gave him her RC10T. During the first season, Kim, Jim and Shaun all moved up from the Novice class to Stock, and by the end of the '96 season, Kim had taken first place in the Stock Truck D-Main at the Fourth Annual Summer Shootout. We all hope your success and enthusiasm continue for many more years.



READERS' rides



SENIOR YEAR "WISDOM"

Chad Wisdom of Greenwood, IN, is so dedicated to R/C that he took his Associated RC10T and RC10GT to his senior class photo shoot. The RC10T is equipped with a Tekin G10-G speed control, a Trinity Buggyweld modified motor, Motor Man 1700 and 1800 battery packs and a Futaba controller. For great looks, he topped it off with a Protoform Rambunctious body. Controlled by an Airtronics Rival radio system, his RC10GT has an OFNA .15 engine, MIP stinger and exhaust pipe, MIP 4N-1 clutch and MIP CVDs. Looks like a great portrait and some great cars, Chad. Good luck with all your plans.

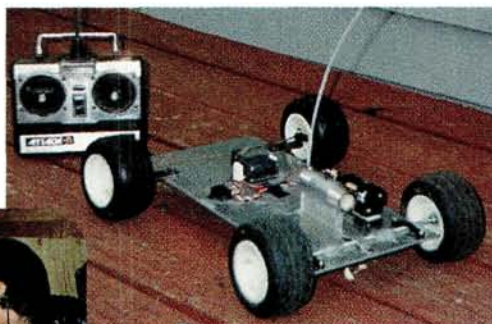


"POLLY WANNA, HUH?"

Laura Martin of Fieldale, VA, didn't even tell us this fella's name when she sent in this photo of her Associated RC10T2, which she races at Fairstone RC Speedway. Perhaps her feathered friend spends so much time with the Futaba Magnum Jr. radio in his claws that she didn't think it strange for him to perch on her ride. The car has a Tekin P12 speed control and is powered by a Trinity Green Machine 2 stock motor, and the Dahm's Rammer body is painted to look like Jeff Gordon's NASCAR racer! Let's just hope Laura keeps plenty of body wash on hand!

SCALE LOOKS

At 10 weeks, Cali Amber Buchino of El Cajon, CA, is just about the same size as her father's Losi Double-X 'CR.' With socket wrench in hand, Cali fiddles with the car to obtain maximum performance. She and her dad run the car both stock with a Trinity motor and mod with a Phantom modified motor. They've upgraded it with titanium turnbuckles and hinge pins as well as Pro-Line M3 compound tires all around. They put the power to the ground with a Futaba receiver, Bulls Eye matched 1700 cells and a Novak Cyclone ESC. If Cali can get this performer going, she'll have a prosperous R/C career ahead, although maybe her mom, Amy, might have something to say about that!



SCRATCH-BUILDER AT WORK

Eric Gardener of Colorado Springs, CO, sent us this picture of his scratch-built chassis and, of course, himself behind the drill. He calls his creation a "rocket-propelled bunch of parts," which he controls with a Futaba Attack R AM radio; he catches the signal with a Tekin mini-receiver and steers with a Futaba SP-S148 servo. The base is a sheet of 1/16-inch-thick 6061-T6 aluminum cut about 1 foot long. Eric added Associated RC10T kit rear wheels and Kyosho Outrage ST kit fronts, all of which spin freely. As the name implies, power is provided by Estes model rocket engines. Eric tells us that all his hard work has helped him create a 30mph performer.



RACE-WORTHY OPPONENT

Tony Wooton of Shepherdsville, KY, is so into R/C that he has built his own 60x80-foot track with a 16-foot drivers' stand in his yard. His Double-XT 'CR' runs off a Peak Performance EBX 14 triple motor with a Tekin 420 G2 ESC and Futaba Magnum Jr. radio gear. He has hopped it up with titanium turnbuckles and top shaft. The Double-X 'CR' gets its power from a Trinity Green Machine 2 motor with a Novak Tempest ESC and Futaba Magnum Jr. radio gear. Like the truck, the buggy is equipped with titanium turnbuckles, and Tony also added MIP CVDs.

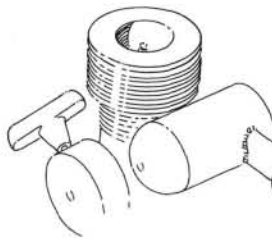


NOVAK
ELECTRONICS, INC. RACING TEAM



PIT TIPS

by Jim Newman

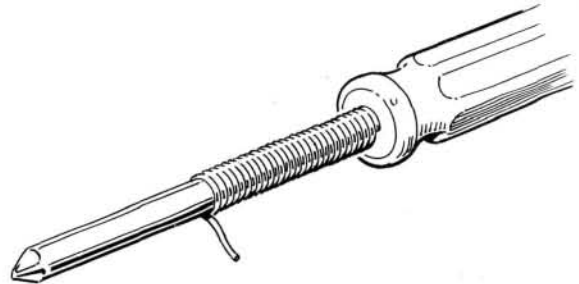
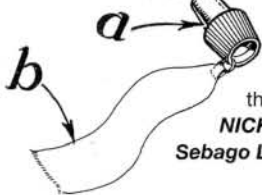


Drip Tip

To prevent oil dripping from your exhaust pipe when your car is parked on your workbench, plug the end with the plastic cap from a marker, or a piece of paper towel.

Flag the end with a brightly colored streamer as a reminder to remove the plug.

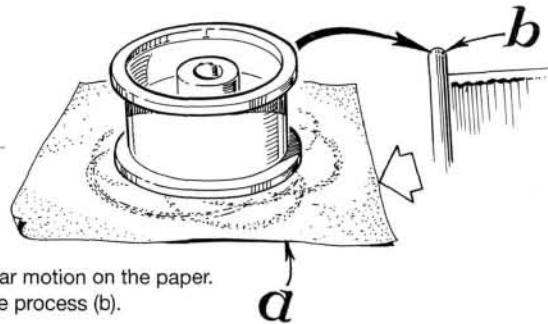
NICK COFFIN,
Sebago Lake, ME



Solder Storage

Wrap a length of solder around the shaft of an infrequently used screwdriver for convenient, tangle-free storage in your toolbox.

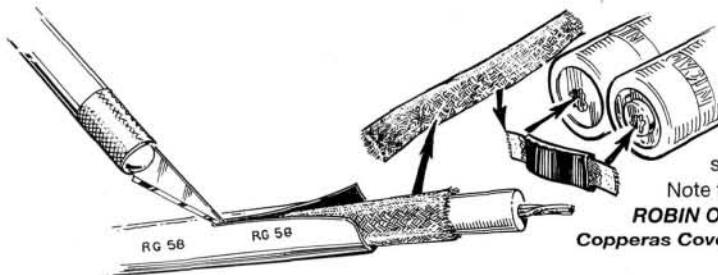
ERIK NIELSEN,
Midland, MI



Rim Shot

When your wheels become scratched from racing, lay a piece of 280-grit sandpaper (a) on a flat surface and rub the wheels in a circular motion on the paper. Smooth the edges of the wheels with the same process (b).

DANIEL FAUT,
Oley, PA



TV Tune-Up

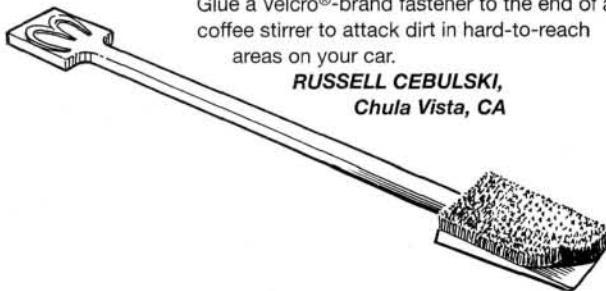
Use a yard of TV cable—available from Radio Shack—for braided battery connectors. Strip the insulation, remove the braided wire covering and flatten the wire. "Tin" the ends of the connectors and Ni-Cd caps with at least a 60W soldering iron before soldering the ends into place. Note the black plastic insulating sleeve on the connector.

ROBIN OLSZYNSKI JR.,
Copperas Cove, TX

MAC Attack

Glue a Velcro®-brand fastener to the end of a coffee stirrer to attack dirt in hard-to-reach areas on your car.

RUSSELL CEBULSKI,
Chula Vista, CA



Thread Fixer

If you strip the plastic screw hole on one of your cars, wrap a piece of plumber's Teflon™ pipe tape around the screw and re-tighten into position.

CHRIS TOLDEO,
Pismo Beach, CA

Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.



TROUBLE SHOOTING

by Doug Mertes

Quick Chassis Fix?

I own an Associated RC10LS with a Beat 2 Alpina radio, a 14-turn quad motor and a Tekin ESC, and I run it on a banked oval track. While practicing recently, it hit the wall pretty hard and the left-front bumper-mounting hole shattered. Is there any way to fix it and avoid having to buy a new \$50 chassis?

I also have an Ultima 2 buggy that I've lowered for on-road. I use a 16-turn double motor and wonder why I feel so much torque off the line. When I gun it at the start, it often spins out,

even though I use a traction compound. Should I try a hotter motor with less torque?

CHRIS BENEDIK
Malta, OH

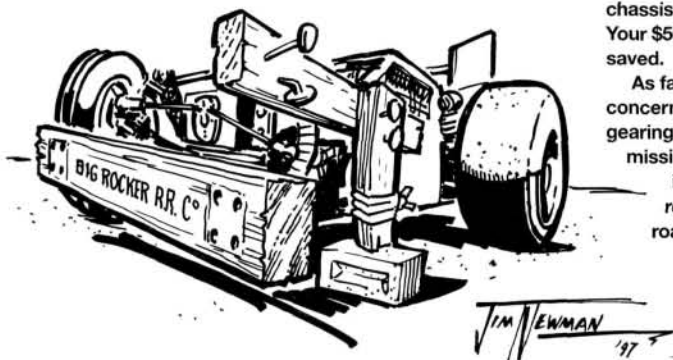
Chris, several years ago, I wrote an "R/C Doctor" about repairing precisely this kind of oval-car damage. It isn't difficult, but you have to buy some materials. You need a 2x9-inch piece of 1/8-inch-thick Kydex from a plastics supply store (most of them sell scrap Kydex pretty cheaply); trace the shape of

your front bumper on it. Draw a line on your tracing between the two lower lobes where the original bumper was bolted to the chassis. Cut out the new bumper with a pair of tin snips or heavy shears. Use contact cement to glue a short, narrow piece of Kydex to the bottom where the original bumper has a ridge that sits against the front lip of the chassis. Drill holes for the body posts and chassis screws and two more in the area you joined between the lobes. Drill and countersink two new matching holes in the chassis plate, and voilà! Your \$50 chassis has been saved.

As far as your Ultima is concerned, the problem is gearing. The off-road transmission's final drive ratio is too low for the relatively small on-road tires, so the motor not only has a lot of

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, Radio Control Car Action, 100 East Ridge, Ridgefield CT 06877-4606. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

punch off the line, but it tops out fairly quickly. Yes, a new motor with a hotter wind will solve your problem, but only because it will tolerate this type of gearing better. You can resolve the problem and give yourself greater gearing latitude by finding an old set of Trinity "underdrive" gears for your transmission. These came in several sizes and were very popular among the dirt-oval crowd five or six years ago. They were very durable, so you'll probably still find quite a few of them floating around if you talk it up among your fellow racers. If you don't, contact Trinity directly; they may be able to help you find what you need.



Diff Stew

I have a Losi Double-X off-road buggy and it rocks! Every now and then, my diff slips and strips the diff and idler gears. My kit came with bushings; I upgraded to bearings, and I've changed the drive rings and all the gears, but this still happens. Do I need to buy a new transmission or a new diff? How can I fix this problem?

DAN COLEMAN
Phoenix, AZ

Dan, you've discovered the single most common malady that befalls Losi owners: melted diff lips. It has several causes, all of which can be cured; in fact, if you follow these instructions, you'll never have to replace a melted diff gear again! One possibility is that you didn't properly tighten the diff adjustment

screw that holds the diff halves together. Or did you use the incorrect bearing for the center of the diff gear? It's very similar to another bearing—of a slightly different size—that's used for the idler-gear top shaft. If these two bearings are swapped by mistake, it's impossible to tighten the screw correctly. (This is easy to do. Does this sound like the voice of experience?) Whatever the reason, when the diff starts to slip, the balls get hot enough to melt—that's right; melt—the diff drive gear. Internal transmission mayhem quickly and invariably results!

Start by completely disassembling the entire transmission. Clean every part with a motor spray that's safe for plastic, and

discard all of the melted plastic stuff, being sure to also wipe out the inside of the tranny case. Buy a new set of diff rings, diff balls, thrust balls and thrust washers, and if necessary, a new diff adjustment screw and nut. Whenever you disassemble the diff, always replace the screw and nut. Consulting the instruction manual that came with your buggy, carefully measure each bearing so that you know which one goes where. Reassemble the transmission, making sure that you tighten the adjustment screw properly so that the diff will not slip when you test it according to the manual's instructions. Before you run your truck

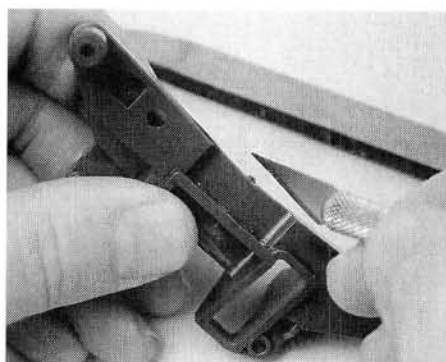
again, find a knowledgeable racer with a Losi vehicle and have him check the diff setting, just to be safe. Your problems are now over: no more meltdowns! ■





Building it Right the First Time

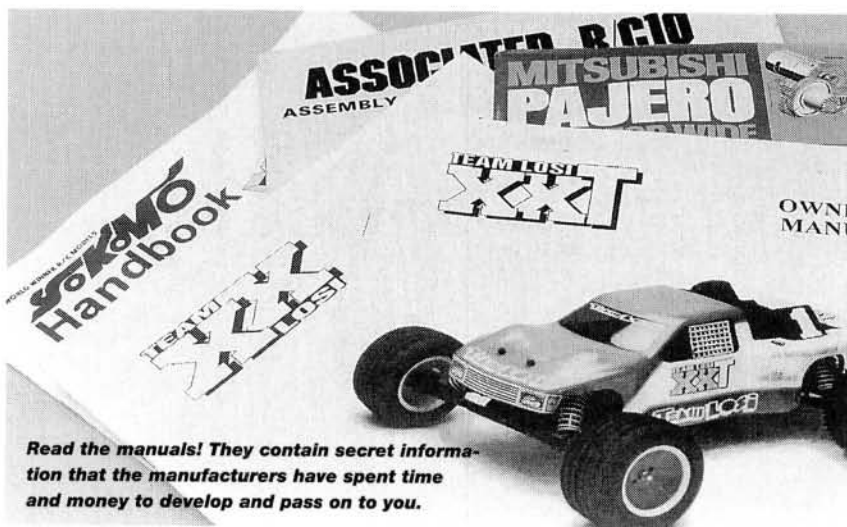
SO, THERE you are at the kitchen table with a soda, a bag of chips, some new tunes on the CD player and a brand-new off-road truck or buggy kit—still in the plastic-wrapped box. You're excited about assembling this super-hot, high-tech rascal and tossing it out on the track to duke it out with your buddies. But you have to make a choice, and you have to make it now: are you going to do the job right, or are you just going to get it done? If you invest a little extra time, patience and research at this stage, you'll earn big dividends later on. Put your new ride together with a little care, and it will last longer, go farther and perform better than if you simply slapped it together in a few hours.



Make sure that the flashing has been removed from all the new, molded parts. A hobby knife or sanding stick works really well.

READING, NOT WRENCHING

Let's start by opening the box. No, don't yank all the bags out; you have some work to do before you assemble anything. The first step is to read the assembly manual that the manufacturers (you know, the guys who are the real experts on your new car or truck) spent so much time



developing. You can learn a lot from reading the manual; you can find out about optional parts, accessory items, or special tools you may need to complete the chassis. Most good manuals also include several pages of tuning tips that you can use as a guide when making shock oil and spring, caster- and camber-setting decisions. I usually spend an evening studying the instructions and making notes in the margins about assembly techniques I don't fully understand, or optional parts I intend to install when I put everything together. If updated instructions were put into the box at the last minute, now is the time to staple them to the corresponding pages in the main manual. I also compile a list of electronics and other parts I'm going to use; that way, everything is in one place for easy completion. I hate it when a project is disturbed because I have to dig through boxes of stuff to find the right servo or receiver!

BAG-O-RAMA

OK, now it's time to open the bags. Remember, the worst thing you can do is to just dump everything into a big, jumbled pile on the table. That's a great way to use the wrong screw at the start, so you'll have to take everything apart later in order to use it. Everyone seems to have a system such as using small, covered plastic containers (like margarine tubs) or egg cartons for keeping the parts organized by bag number. I've found that clear, sandwich-size plastic bags with zipper closures work pretty well: you can see the parts, the bags are big enough to allow you to stick your hand inside and fish around for what you need, they're easy to close and seal if you have to put everything away, and the original bag's label fits inside so you'll know what's supposed to be in there. My preference, however, is to group everything into small piles by bag number. That's easy for me to do, because I had my "secret laboratory"

expanded last year, and it includes a workbench area exclusively for assembly. If it takes me several days to complete a new kit, it's no big deal, but if (like most people) you can't spread things out and leave them until you've finished, one of the other methods may be better for you.

PARTS IS PARTS

Don't put anything together yet; first, you have to prep the plastic and nylon parts. Some kits have molded parts on plastic trees; the tree is actually the runner that remains in the pathway of the injection mold when the parts are made. These parts can be removed with a side cutter (a type of pliers with short, sharp blades), a scissors, or nail clippers. Resist the temptation to simply twist a part until it breaks free; you may damage it. Similarly, you should refrain from slicing parts off the tree with a sharp blade, because it's too easy for your hand to slip and gouge another part (or your finger). Once a part has been cut off, it's

worthwhile to make sure that its edges are free of bumps and nubs where it was attached to the tree; a hobby knife or sanding stick will do the job nicely. If the parts are white nylon, you may want to dye them. Use a large saucepan, about a quart of boiling water and some fabric dye (Rit or Tintex brands work well and are available at most supermarkets). Boil the parts for 15 or 20 minutes, until they're the shade you want. Hard plastic parts can't be dyed with this method because they'll warp, but some folks swear by the prepared, cold-water dyes that are available through some hobby retailers. Many top-of-the-line kits from Associated*, HPI* and Trinity* now come with the parts dyed black; they do this rather messy job for you, and they do it properly.

NICE THREADS

As you complete the various subassemblies, go the extra mile to make sure the job is done properly. For instance, self-tapping screws are well-named, because they cut new, coarse threads in soft materials like plastic or nylon. They have deep, sharp threads and shallow grooves cut into the tip to give the material being cut from the threads someplace to go. Most kits, however, also use socket-head or flat-head screws with machine threads that



Whenever you can, use a tap of the proper size to cut threads. This ratcheting tap handle makes the job much easier!

look as if a nut could be twirled onto them. Because the grooves are very fine and shallow, they don't do a good job of cutting new threads. That's why you should purchase a couple of taps in the proper size and thread count; they're designed to cut the new threads correctly, and they'll remove the cuttings in the process. Industrial supply and machinist companies like MSC*, as well as many hardware stores, can sell you taps in 4-40, 8-32, 3mm and 4mm sizes; these should cover most of your needs for almost any kit available. You could use a pair of pliers to turn the tap, but there's a much more elegant solution: a tap handle. Less expensive, T-shaped handles work just fine, but I prefer the lovely ratcheting handle made by General (part no. 160R, available from MSC for \$20, stock no. 05041603). A tap handle makes it easier to ensure that your threads run straight and true.

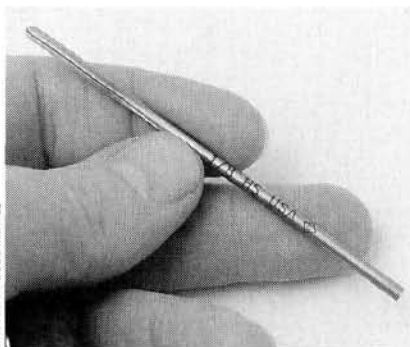
When you use a tap, you'll find that it's much easier to maintain your truck or buggy; you'll appreciate your foresight as you remove all the screws that run through the chassis plate into the transmission or suspension bulkheads.

THEM FLOPPY ARMS

It's important to have smooth suspension movement so that small tuning changes result in big performance improvements. That can't happen if the arms stick or bind at any point during their travel. The bulkheads in new kits frequently grip the hinge pins so tightly that free movement isn't possible. You could jam it all together and hope that things will just "wear in" properly, but that's bush league! Pro drivers take the extra time to make certain everything works properly from the outset. The easiest way to check for freedom of movement is to attach each suspension arm, but do not install the wheels and shock absorbers; now, see whether the arms, hub carriers and spindles flop around and drop under their own weight.

Are things too tight? Then check out this nifty reaming bit (left) found at most tool and hardware stores (this one is a Cleveland 1/8-inch reaming bit, part no. 25216, available from MSC for \$5,

A reaming bit like this one will smooth the pin bores in arms and bulkheads so you'll have hitch-free suspension movement.



PHOTOS BY DOUG MERTES

TEAM SECRETS

Drag Brakes and The Cyclone

One of the unique features of the Cyclone ESC and the ESC Profile Software are Drag Brakes. Basically, Drag Brakes allows you to turn the deadband area of the Cyclone ESC into brakes.

One of the most difficult tasks to do driving an R/C vehicle is to apply the same amount of braking power at the proper time, lap after lap. The Cyclone's Drag Brake function makes the application of brakes repeatable every time you return the throttle trigger to the neutral position. This means you no longer have to try to find your braking position by pushing the throttle trigger forward. An additional benefit using Drag Brakes is power can be reapplied immediately with no delay after braking has been completed.

There are two ways to set-up Drag Brakes in the Cyclone ESC.

Method 1. From the ESC Profile Software edit menu, go to #8 and turn the Drag Brake option on. The Drag Brake is active, operating at the current Brake PWM Frequency. The amount of Drag Brake is adjusted by the Brake pot on the Cyclone ESC. Minimum brake is no longer active. Turning the Drag Brake Option on gives you the ability to adjust the Drag Brakes at any time without the computer interface.

Method 2. From the ESC Profile Software edit menu, go to #9 and select a Drag Brake Frequency. The default is 3.9 KHz. Then go to #10 and enter a Drag Brake Value. The Drag Brake Value is measured as a percentage of the full brake value. So, your entry will be 10.0% or 15.2% or 13.8%. Changing the Drag Brake Value is just like adjusting the brake pot in Method 1. The difference in Method 2 is minimum brake is still active, so if you need to push the throttle trigger forward for additional brakes, the amount of minimum brake can be adjusted independently of the Drag Brake Value. The major benefits of Method 2 is the drag brake can be adjusted in small steps by changing the Drag Brake Frequency and/or the Drag Brake Value, and that both parameters can be repeated.

Drag Brakes can lower you lap times by decreasing the time it takes to access throttle and brakes. Don't be afraid to experiment. Try as many different settings as you can. This will enable you to become more familiar with tuning your ESC. Remember, the ESC Profile Software is an electronic tuning tool and it should be used to complement all of the other tools you use to tune your vehicle.

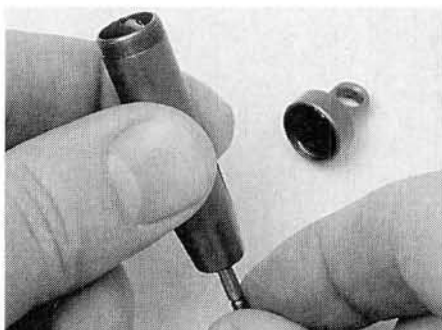
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18910 Teller Avenue, Irvine, CA 92612
• (714) 833-8873 •

Advertisement

TS442



stock no. 63751085); make sure the one you buy is the same size as your hinge pins. It is mounted in a tap handle, and you can use it to remove casting flashing from the inside of the pin guides in the suspension arms and bulkheads. It's better than a drill bit



When you fill the shock with oil, make sure that all the air is removed from beneath the shock piston. This is especially critical when there are spacers under the piston.

because the sharp, 45-degree cutting blades won't ever make the hole bigger than it was meant to be.

Are things too floppy and loose? Take up the slack with some thin spacers; you can find them in any size you need at most hobby shops. Trinity also sells sets of spacers that come organized in handy, purple plastic boxes.

BUSHINGS AND BEARINGS

Before you install bushings and bearings in the hub carriers and transmission, it's a good idea to prep them. Although some bearings come lubed and sealed, most should be cleaned and oiled properly. This is easier to do when they're new than when they're dirty and gritty (or ruined!). Use motor spray under pressure to thoroughly rinse out each bearing, or use a soaking fluid for bearings such as the one made by Boca Bearing*. After you've

cleaned them, allow the bearings to dry completely, then use a little bearing oil or Mobil 1 to lubricate them properly. Some racers like to use a dry lubricant like Paragon* Ultra Lube because they feel it attracts less dirt. Don't re-oil dirty bearings or bushings; the oil will just mix with the fine grit on them and form a paste that eats away the load-bearing surface in no time at all. Bearings don't require regular oiling as much as they require regular cleaning and maintenance. Set up your bearings correctly, and all you'll have to do is re-spray and oil the exposed ones every couple of weeks.

FREE AND EASY

How well will your transmission transfer power to the rear wheels from that hot stock motor you're going to install? Unless you spend some time making sure the tranny runs free and easy, turning the gears will just waste power that should be helping you blaze through the turns. I usually assemble and then disassemble a new car's transmission two or three times, until I'm sure it works just right. To make it perfect, I may have to file down part of the inside of the gear case, or thin one of the shims, but in the long haul, my transmissions almost always stay sealed for the life of the car or truck! I never used to put anything on the gear faces, but several years ago, I tried Aero-Car* Gear and Gear Diff Lubricant. It's a thick, pink, gooey substance that's hard to get off your fingers. It doesn't feel very slippery, but it spreads around on the gear teeth very well and

gives a smooth, gliding feel to the gear set when it's spun. I've used it on off-road cars like my Losi XX and XXT, and on numerous 4WD cars like the Tamiya TA02 and TA03.

SHOCKING!

When it's time to assemble the shocks, most builders remove the flashing from the shock pistons, but you can do much more than that. To make sure these little wonders work smoothly without leaking, coat the rubber O-rings with either RCPS* green slime or Trinity Purple Stuff when you assemble the lower end of the shock bodies. This eliminates much of the stiction and results in super-smooth shock action that lasts and lasts. It also seems to make the O-rings seal more effectively, even when they're exposed to the dust and dirt that come with playing off-road. If your kit calls for spacers underneath the piston, make sure you pump the shaft up and down a few times to eliminate air bubbles when you fill the shock body with silicone fluid. It's very easy to trap air below the piston when you fill it with shock oil, and it will make a "squishy" sound when you work the assembled shock absorber. Since air moves through the holes in the piston more rapidly than the shock fluid, trapped air will cause inconsistent shock action.

LITTLE STUFF

Do the tires run straight and true when they're mounted on the wheels, or do they wobble? Take the time to set them up properly before you have to figure out why you're not getting any traction at

top speed! No matter what your friends say, those tires should run true with very little side-to-side action, even if you must pull them off and readjust them on the rims a few times until they're perfect. Trust me; it's a lot easier to mount tires properly in your workshop than it is at the track!

Did you wash those rims in hot, soapy water before you glued on the tires? If you didn't, start over. Glue won't stick to wheels that still have oil on them—not now, not ever. Do the tires and wheels seem unbalanced when you spin them? If one side is heavier, consider balancing them; but first, be sure they are properly mounted.

I'm sure you've managed to grace the new body with a gorgeous paint job, but is it mounted correctly? Ideally, the body should just plunk down onto the posts when you drop it onto the car. If you have to twist, stretch, or force the body into position, it can tweak your suspension or chassis in subtle ways that can be difficult to figure out later.

Right about now, you're probably saying to yourself, "This is an awful lot of work just to put a car together," and you're right. But when you consider that everybody has access to the same kits and that most national races are won with cars and trucks that look surprisingly stock, you have to wonder why more people don't pay attention to all this little stuff. It's the difference between diving under the competition in tight turns and settling for second place.

*Addresses are listed alphabetically in the Index of Manufacturers on page 201. ■

PRODUCT WATCH

Need to know what's new? What works well and what doesn't? This section is devoted to objective reviews of all R/C car accessory items. From gears and wrenches to motor brushes and shock springs; if you can use it with your R/C vehicle, you'll find it critiqued on these pages.



48
Performance
Hobby
Bearing
Taper



48
Robinson
Adjustable
Ball Ends



50
Roland
Digital
Group
STIKA

ROBINSON RACING

48-Pitch Cluster Gear for the TA03

WHEN TAMIYA introduced its new TA03 sedan chassis last year, everyone raved about it. With its front-motor design, single-belt-drive system, upright shocks, swaybars, stiffly boxed chassis and adaptability to existing wheels and bodies, it's considered to be truly state of the art. When it won the NORRCA Nationals, however, people started to consider it as a serious racing platform.

That's when the reality set in: these cars use a special set of spur gears that require—you guessed it!—a matching set of special pinions that very few people own. The ones that you use on your TA02 won't work, nor will 64-pitch SAE pinions like those that most on-road and pan-car enthusiasts already own (the TA03F-Pro uses the .04 module pitch spur gears that fit Tamiya's popular 103 series Formula 1 and Indy cars).

Robinson Racing Products*, however, figured out an easy way to resolve this dilemma and help new TA03 owners avoid having to buy yet another complete set of expensive pinions that would fit only one or two cars. The company recently released a new cluster-gear setup that comes complete with a pair of interchangeable true SAE 48-pitch spur gears. Because 48-pitch gears are more popular than any other type, Robinson figured that this would be the least expensive alternative for the average racer. With 48- and 50-tooth spur gears available from Robinson, virtually every gearing option can be covered for both stock and modified class racers.

These cluster gears are easy to install: screw either a 48- or a 50-tooth spur gear onto the cluster unit, to replace the stock one-piece cluster gear. The aftermarket cluster gear accepts all the stock bearings and bushings and meshes with the metric pitch diff gear perfectly. The only change you'll notice is that, even though these are 48-pitch gears, they're very quiet—in fact, much quieter than the gears that come from the factory. That's probably because they're machined, instead of molded, from strong, virgin nylon. Oh, yes; you'll notice one more change: your wallet will be much heavier with the bucks you'll save by not having to buy another rack of pinion gears!

—Doug Mertes

PUTTING
AMERICAN
GEARS IN
OUR NEW
JAPANESE
FRIEND



PHOTOS BY DOUG MERTES

TRINITY Hand Wash

SO THE FIRST qualifiers have ended and you're thrashing on your car or truck like a madman. You've been using motor spray, tire goop, grease, shock oil and bearing lube, and getting dirt and dust all over yourself. Then, you get the word: the pizza that you and your friends ordered has arrived. Here are your choices: wipe your hands on that black, greasy rag you've been using to clean off your tires and shocks; rub your hands on your jeans (assuming that you aren't wearing shorts); stick your hands in that bucket of questionable water that has been used all morning to scrub off dirty tires; try to find a source of running water to wash your digits; or reach for your toolbox. Wait a minute; reach for your toolbox?

Yes, thanks to the good folks at Trinity*, you can do just that. Their recently released Hand Wash is a waterless prod-

uct that emulsifies and removes all sorts of nasty chemical residues and sticky gunk that get on your hands as you work in the field, track, or parking lot. Just squeeze some onto your hands, rub them briskly together and wipe them on a reasonably clean rag or paper towel, and most of the junk will disappear. It's specially formulated to remove the stuff that we R/C folks use, so it does a better job than some of the more common commercial waterless cleaners. It also comes packaged in a handy container that's sized to fit in your toolbox.

Although it won't sanitize your hands (you'll need soap and hot water to do that), it will remove most of the truly nasty stuff. At the very least, your pizza will taste a whole lot more like pepperoni and a whole lot less like Zip Grip!

—Doug Mertes



THIS'LL TAKE THE FUNK
OFF YER FINGERS!

PRODUCT WATCH

PERFORMANCE HOBBY Bearing Taper

I HAVE A lot of neat stuff that I use to work on R/C cars: folding car stands; machined Allen wrenches; color-coded nut drivers; itty-bitty screwdrivers. You name it. My new favorite tool, however, is decidedly low-tech and dirt-simple. Say hello to Performance Hobby's* Bearing Taper.

Like the other tools in Performance Hobby's line, the Bearing Taper is a humble chunk of plastic that has been lathe-turned into a functional piece of equipment. Although the Taper is little more than a plastic spike, it will help your next rebuild go more smoothly, and it will improve the performance of your bearings!

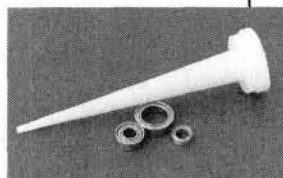
The Taper helps out on the bench in two ways. First, it allows you to hold any bearing, small or large, for cleaning. Just slip the bearing over the Taper and spray away. "Big deal," you say; "I just lay my bearings on a towel and blast 'em." Yeah, and sometimes you blast them across the bench, dontcha? I know I do. More important, the towel method doesn't really let the cleaner pass through the bearing; cleaner goes in, but it doesn't come out. The Taper lets the cleaner flow out and take the dust, dirt and debris with it.

What, you ask, is the second thing this pointy pit pal can do? It has no moving parts, so it can't be much—right? Wrong! This is the really cool part. Once you've blasted all the dirt in your bearing to crud heaven, it's time to listen to the bearing for cleanliness. Yep, I said *listen*. Just place your bearing on the tool, put the big end of the Taper up to your ear and turn the bearing with your finger. The plastic is much more resonant than air, the usual medium we hear sound through. Every little piece of grit

can be heard. When you can get your bearing to make a sound like a seashell held to your ear, believe me, it is as clean as it can get. I listened to some bearings I thought were clean based on the "Hmmm; feels pretty smooth to me" test, and they sounded like a freshly poured bowl of Rice Krispies.

After rebuilding my pan car with bearings that I *knew* were clean (as opposed to bearings that I *thought* were clean) I noticed a definite increase in spin time on the rear axle and front wheels, without any rumble from the bearings. What a difference clean bearings can make! That's sure to result in longer run times, reduced motor heating and more punch. The downside? I look a little silly with a plastic spike sticking out of my ear, but that's R/C for you.

—Peter Vieira



ROBINSON RACING Adjustable Ball Ends FUNDAMENTAL RETHINKING

OVER THE YEARS, I've seen many innovative ways to reduce slop in suspension and steering links that have metal ball ends and

molded nylon ball cups. I've suggested that small O-rings be placed over the ball standoff, seen orthodontic rubber bands stretched over the ends of the links, filled ball cups with thick grease, purchased oversize ball ends and stretched the cups to fit them and placed thin plastic film over the ball end itself, all in an effort to eliminate the wiggly feeling that too much play between the ball and the cup causes. The problem is, you need just a teeny bit of play for the assembly to work, but manufacturing tolerances make it very difficult to maintain such small clearances.

So there you are with your brand-new (or not-so-brand-new) off-road car or truck on the table, making camber settings with an angle gauge. You carefully adjust the turnbuckles so that there are 1½ degrees of negative camber at each corner, then you pick the truck up and smooch it down. Check the settings again, and see what happens: one corner now reads just under 1 degree, and the opposite one measures almost 2 degrees! What happened? Most likely, the clearances between the ball ends and ball cups are too large, and you have to figure out a way to deal with it. That's when Robinson Racing Products* comes to the rescue.

You probably already know Robinson Racing as a purveyor of super high-quality machined gears and titanium ball ends, but Robinson is also a diehard off-road racer who is always looking for the right fix for tough problems. His solution for ball ends that differ slightly from part to part was to come up with an adjustable ball cup that fits virtually any ball end on the market today. The cups themselves were designed for very low friction because the part that grips the ball is actually octagonal instead of round; this means that the ball end is gripped by eight little points instead of the entire circle of nylon. The other innovative component is the setscrew that's threaded into the top of the ball cup. This allows us to reduce the space between the top of the ball and the inside of the cup until the fit is perfect.

Are these the answer to all suspension-linkage blues? Not really. They work best when used in single-plane applications like suspension upper links and servo-to-steering-link connections. Problems arise, however, when a slightly flat-topped ball is used with these ball cups on two-plane applications like steering spindles. Ask that assembly to go back and forth as well as up and down, and the setscrew will drag across the flat part of the ball onto the curved part and pop the ball cup off. You'd be better off using more conventional ball ends and cups in these circumstances, even though they aren't as precise. Take a careful look at your car, truck, pan car, or sedan, and you'll find that all but one or two of its link ends could benefit from these neat ball ends. They come in shorter lengths for Associated cars and trucks (part no. RRP2013) as well as longer Losi versions (RRP2012). Try them once, and I guarantee that you'll never go back to old-style ball cups.

—Doug Mertes



ROLAND DIGITAL GROUP STiKA Decal/Mask Maker

THE STiKA Intelligent Cutting Machine is manufactured by the Roland Digital Group*. To any R/C hobbyists who are musically inclined, that name may sound familiar. That's because Roland is the company that makes those great-sounding keyboards and drum machines, so I knew that I was working with a high-quality product.

Over the last few years, I have seen advertisements for the STiKA decal/mask maker. The ads are very modest and don't do the machine justice. Beyond that, the machine does just what it states in the ads, and very snappily, I might add. I've been a decal/sticker fanatic since I built my first static model. Whenever I wanted to do a car body with graphics or letters that weren't commercially available, I cut the letters out of vinyl by hand. Let me tell you, this can be a time-consuming task. With STiKA, most of the work is in finding and preparing the subject to be scanned.



The important key to good-looking lettering is starting with an original copy with a clean, clear image. The unit works best if the letters are either black on white or white on black. It may be necessary to use a photocopier to reduce or enlarge your original. I used computer-generated letters, but lettering, logos and other simple graphics can be used right out of magazine ads, from product packaging and any other source you can find. STiKA can make letters as large as 2½ inches high or as small as ⅛ inch. If you have a PC that runs Windows, the included SignMate software lets you use any font (type style) installed on your system and any tiff graphics. This little guy is very versatile.

How does it work? The Intelligent Cutting Machine (TICM) is actually a handheld scanner. You lay the artwork or lettering on a clean, flat

surface. Then, roll STiKA over the lettering from right to left (there are small rollers on the bottom). Scanning from left to right will produce a mirror image of the letters. This can be handy for making lettering to be used on the inside of the vehicle body. The material being scanned is viewed through the window on the front of the unit. When the scan is successful, the green LED "picture" light will come on. The scanned image is saved in the unit's memory until another scan is made or the power is turned off. The material, mask, vinyl, etc., sheet has to be 3⅝ inches wide to fit into the input slot. Now the sheet can be fed into the slot on front of the TICM. A small cutting blade trims out the artwork/letters. What used to take hours now takes only a few minutes.

The Intelligent Cutting Machine does exactly what its manufacturer claims. The only negative point I found was that, when smaller letters are produced, the machine tends to round off the corners rather than making sharp edges. I see numerous uses for this unit. Hobbyists (pro or otherwise) who make their own custom lettering, graphics, etc., should seriously consider STiKA! It's a real time-saver! The unit may be a little pricey (\$299 plus S&H), but, for someone interested in making cool custom-looking models, money is no object, right?! Roland has been in the electronics business for years. I've owned several of their musical products, so I know this is an excellent product. I can see this unit making concours judging even tougher than it was before!

—Kevin Meyer

*Addresses are listed alphabetically in the Index of Manufacturers on page 201.



Above: the result is pretty amazing. The "Neuspeed," "Accord" and "H&R" lettering was done with the STiKA unit. Left: to scan, roll the STiKA over the lettering. Moving the unit right to left gives you right-reading lettering. Moving from left to right will create a reverse image.



I love creating fictitious race teams. The STiKA decal maker came in handy for creating my "Goodtruck" logo. The "Snap-on" logo was also made with it.

PHOTOS BY KEVIN MEYER



TEAM LOSI **XX-4**

FALL 1991: racing trucks vault into the R/C off-road limelight, the tide of 4WD off-road buggies recedes back to Japan, and I write an article entitled, "What's the Jive with Four-Wheel Drive?" in which high cost, suspect durability and the scarcity of parts were cited as reasons for the demise of 4WD off-road in the U.S. Did Team Losi* read that article? They must have, because the new XX-4 4WD buggy addresses all of these issues while adding unparalleled rough-track handling and a fully sealed drive train to the mix.

Few would argue that the XX-4 is the most highly anticipated new car release of this year, of perhaps even the decade. But is the XX-4 truly as good as it sounds, and will it rejuvenate the ailing 4WD off-road class in the U.S.? Read on to find out.

by Frank Masi

Re-inventing **Four-Wheel Drive**

XX-4

On track

For its first official outing, we pitted the XX-4 against the modified truck class at R/C Madness in Enfield, CT. (As the only XX-4 in town, it had no other 4WDs to play with.) This track usually gets pretty bumpy (we also ran 1/8-scale gas buggies on the same day, and you know how these can tear up a track), and modified trucks often turn the fastest lap times; at least, they did before the XX-4 showed up.

The XX-4 proved right away that it had the measure of the trucks. Put a pass on a truck, and the XX-4 would make it stick with just a little throttle. Unbelievably, the XX-4 seemed to go through the bumps and ruts better than the trucks with their huge, bump-absorbing tires and wider suspension arms. That day, the XX-4 turned the fastest qualifying time (this includes times set by trucks and modified 2WD buggies).

The following week, there was a full class of XX-4s; obviously, the track's hobby shop had received its first shipment from Losi! Believing that it would work better with pistons that had larger holes, I changed my XX-4's setup a bit. I removed the kit's no. 57 (Black) front pistons and no. 56 (Pink) rear pistons and installed no. 55 (Orange) pistons in all four shocks. Then I filled all the shocks with Associated* 35WT silicone oil.

Overall handling was great, but the car couldn't clear a set of widely spaced doubles. A few of the other drivers—still using the stock pistons that provided more pack—were easily able to clear the jumps. After several attempts and several horrible crashes, I decided that taking one jump at a time was the order of the day. Having heard nightmare stories of the easily broken XX-4



SPECIFICATIONS

SCALE 1/10
LIST PRICE \$499.95

DIMENSIONS

Length overall 14 in.
Wheelbase 10.7 in.
Width (F/R) 9.7/9.8 in.

WEIGHT (Gross, RTR) 3 lb., 10.3 oz.

CHASSIS

Type Molded tub
Material Graphite composite*

DRIVE TRAIN

Type Sealed, triple-belt drive
Transmission (F/R) Universal swing shafts
Differential(s) (F/R) Adjustable ball diffs
Slipper clutch (F/R) Independent F/R pads

Bearings/bushings 20 ball bearings (Teflon™ seals on critical bearings)

SUSPENSION (F/R)

Type Lower wishbone/adjustable upper link
Damping Losi Hard Body oil-filled shocks/coil springs

WHEELS

Type (F/R) Molded five-spoke
Dimensions (DxW, F/R) 2.2x1/2.2x1.375 in.

TIRES

Front Losi Silver IFMAR pin 4WD
Rear Losi Silver IFMAR pin

*The initial production run of XX-4s includes Losi's optional graphite chassis as a bonus feature. Subsequent kits have chassis made of Losi's Stiffezell composite.



PHOTOS BY JOHN HOWELL & WALTER SINAS

It's hard to describe **the XX-4** in conventional terms; **unlike most other cars,** which are compilations of various components, **the XX-4** seems to be **almost organic.**



The **forward-mounted motor** is flanked by a pair of pulley shafts. The front shaft incorporates an 84-tooth spur gear, a slipper clutch and a pair of pulleys (one drives a belt to the front diff; the other drives a belt to the rear pulley shaft). **The XX-4 has an externally adjustable slipper clutch** that uses two separate slipper pads. One pad (made of standard material) works for the front diff, while the other (made of a different material that operates with more friction) provides slipping action for the rear diff. Because they are subjected to the same tension from the slipper-clutch spring, the difference in the pad materials allows **a looser slipper "setting"** for the front diff than for the rear—**pretty clever.**

The **front hub carrier and spindle designs** allow the XX-4 increased front suspension travel it needs to cope with bumpy tracks. The spindles have been lowered in relation to the suspension arm; this not only **allows more up-travel** (the drive shafts aren't at an extreme angle as they would be with more conventional designs), but it also brings the **steering pivot point more toward the center** of the wheel for less **"jacking,"** i.e., lateral sliding of the tire during steering.

The XX-4's center is its **molded chassis**—a masterful maze of channels and braces that serves both as spine and as home for the fully sealed belt-drive system. To minimize "hobby-horsing," i.e., that front-to-back rocking we sometimes see when cars take on bumps and ruts, the chassis has the motor up front and the battery pack toward the rear. This balanced weight distribution ensures that **the XX-4 floats over bumps** and **jumps like no other 4WD** chassis and does as well as, **if not better than,** a 2WD buggy.

The **rearward pulley shaft** transmits power to the rear diff. Losi has virtually eliminated belt skipping by combining a rear belt with larger teeth (the center and front belts are fine-toothed) and large-diameter pulleys that provide plenty of surface for the belt to grip. Despite these differences in belts and pulleys, the **front and rear wheels** are driven at the **same ratio.**

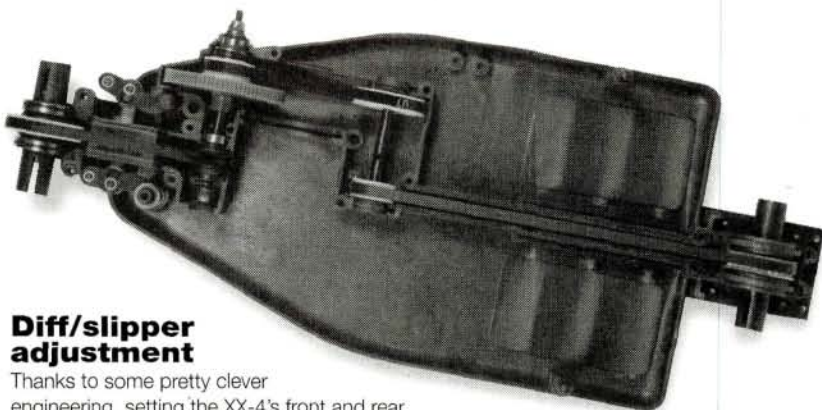
The rear diff—it's like that of the Double-X buggy—is attached to the main chassis with offset, molded-plastic inserts that can be installed in various combinations to subtly **adjust rear-belt tension.** I installed the inserts as recommended in the instructions, and **I didn't see any belt skipping** during the testing.

The **front-suspension bulkhead** provides a mounting point for the forward-swept, ultra-rigid suspension arms. It also serves as the lower portion of the front diff enclosure. **A molded cover** stretches from the forward pulley shaft to enclose the diff and **strengthen the front end.** By using molded-composite diff halves and ultra-light universal-joint drive shafts, Losi has created a lightweight 4WD system. As a result, **the XX-4 carries less weight** over its front wheels than other 4WDs.

Technical Highlights

Motor mount

The Losi guys didn't invent the "rotating offset cam" motor mount, but they have perfected it. When you get the hang of orienting the motor with the aluminum mounting plate, setting the XX-4 gear mesh is easy—easier than on any other car I've owned. Bolt the plate to the motor (hint: bolt the motor low, and use the motor-screw holes that position the motor as "counterclockwise" as it will go); install the plate and motor on the chassis; remove the neat little rubber access plug so you can view the mesh; set the mesh; tighten the motor clamp; go race.



Diff/slipper adjustment

Thanks to some pretty clever engineering, setting the XX-4's front and rear diffs and its slipper clutch couldn't be easier. The front and rear pulley shafts each have a small hole through their centers. These holes align with ones in the upper chassis cover. An Allen wrench inserted through both the hole in the cover and the one in the shaft locks that shaft. Locking the front shaft lets you test the setting of the front diff (by trying to turn both front wheels) and the rear slipper pad (by trying to turn both rear wheels). Locking the rear shaft lets you test the rear diff and the front slipper pad.

The "Clicker"

Losi's alternative to a 4WD's traditional one-way bearing is so simple in its design that you're bound to wonder why no one else has thought of it before! Allowing a 4WD car's front wheels to "free-wheel" allows a car to turn more tightly, especially when on power.

The XX-4's clicker functions like a ratcheting wrench. It's made of a special belt pulley and a plastic washer, both of which have one side in which there are small, stepped channels. The pulley and washer are installed in the XX-4's front pulley shaft with their stepped sides facing. The washer is keyed to the shaft, and the pulley (whose belt is connected to the front diff) can revolve freely about the shaft. When throttle is applied, the steps of the keyed washer interlock with those of the pulley to drive the front wheels. Backing off on the throttle lets the pulley and washer "ratchet" to allow the front wheels to coast (this makes a clicking sound; hence, the name). How freely the wheels coast can be adjusted by tightening or loosening a small spring that presses the washer and pulley together. By replacing the spring with a small spacer (not included), the "clicker" can be locked to prevent the front wheels from free-wheeling. Doing this takes away some on-power steering, but it provides four-wheel braking.

But you're saying, "So what? A front one-way bearing will do the same thing." Well, not really. First, you really can't adjust the tension of a one-way bearing; and second, replacement parts for Losi's clicker assembly cost just a couple of bucks, but one-way bearings—and the hardened-steel shafts on which they ride—can cost as much as \$40.



XX-4 On track

front bulkhead, I was quite impressed with its durability; it survived unscathed. I finished third that day.

For the next weekend, I changed back to the stock 57 pistons up front and 5-5-6s (Pink no. 56 pistons that have two holes enlarged with a no. 55 drill bit) with Yellow springs in the rear. I was very happy with this new setup; the car had more consistent steering and was incredibly stable over the huge jumps that track owner Chris Marcy had built for his annual "supercross" race. Chris also raced with a XX-4; in fact, on the previous weekend, he had been the man to beat, and I was gunning for him on this Sunday!

On the start of the second qualifier, as I slowed for a large, table-top jump, another XX-4 came in from behind at full bore and slammed both cars to the dirt with a sickening snap that meant only one thing: broken bulkhead. Although my XX-4 had survived quite a few ugly crashes, it was now down for the count. Apparently, if the car lands in a certain way on one front wheel, the bulkhead lets go. This, in my opinion, is the car's only weakness, and it's one that Losi has quickly addressed (see "Does the XX-4 Have a Weak Spot?"). Luckily, the hobby shop had a new bulkhead that took only five minutes to install.

The Main had the stuff of racers' dreams: a close battle for the lead and a car that was working great. Chris and I swapped the lead at least four times and spent the first 2 minutes only 2 feet apart. The XX-4 loves to be driven hard, and it doesn't beg for mercy when the track gets rutted. With 1 minute left to go, the right front wheel decided that it was time to leave! I hadn't used Loctite* on the screw that secures the drive shaft to the axle, and the screw had backed out (nothing damaged, except my pride).

Now, after weeks of testing, I can testify that the XX-4 is the new benchmark for 4WD performance, especially for the average racer running on a typical club track. With the exception only of its original front bulkhead, the car has shown itself to be durable and easy to maintain, right out of the box. The XX-4 can be driven hard through the bumps (I can't say that about any other 4WD I've raced), and it jumped phenomenally well without "slapping" as it landed. Team Losi should be commended for their achievement.

TEST GEAR

- Airtronics* Caliber 3Ps FM transmitter, no. 92237 3-channel 27MHz receiver and 94157 heavy-duty steering servo.
- Novak* Cyclone programmable speed control. Profile 1 selected.
- Trinity* DIRTinator 2, 11-turn double wind. This new wind was designed especially for 4WD off-road racing.
- Trinity VIS-EX-TRA Sanyo RC-2000 cells. These have been specially conditioned to achieve higher voltage for better acceleration and more "punch."

Building & Setup Tips

- When assembling the drive shafts, use thread-lock on the threads of the screws that secure the plastic U-joints to the shafts.
- Disassemble the prebuilt shock cartridges and re-assemble them using a liberal dose of RCPS® Green Slime shock-seal lubricant. Doing this reduces shock "stiction," allows smoother shock action and reduces oil leaking.
- When you assemble the rear suspension arms and arm mounts, pay particular attention to the instruction manual. Match the arm mount marked "L" with the suspension arm marked "R"; vice versa for the other pieces. Note: this is not a mistake; the rear arms are the same as those on the Double-X buggy, on which they are installed in the configuration as marked.

THE HOT SETUP

Losi's Jack Johnson came up with this "factory" setup during the IFMAR Worlds warm-up race at the Ranch Pit Shop (site of the Worlds this August).

Front

- Front shocks—drilled 5-5-6 pistons; 35WT oil; no spacer on inside of shock; Losi Green springs.
- Shocks mounted in middle hole in suspension arm and outer hole in shock tower.
- Camber link—middle hole in shock tower; three Gold washers under outer ball stud.
- Ride height—drive shafts slightly below level. Chassis should dip slightly to the front (viewed from the side).

Rear

- Rear shocks—no. 54 pistons; 40WT oil; one "A" spacer on inside of shock; Losi Yellow springs.
- Shocks mounted in outer hole in suspension arm and outer hole in shock tower.
- Camber link—no. 5 hole in rear bulkhead; no. 3 hole in hub carrier.
- Ride height—drive shafts slightly below level.
- Replace stock hub carriers with optional, 2½-degree hub carriers for less toe-in.
- Install wedge (shim) under the front of the rear-arm mounts to increase anti-squat (slot the wedge's hole for easier installation).

Note: this setup doesn't provide as much initial turn-in as the stock setup, but mid-turn steering is increased. It also makes the car particularly sensitive to changes in ride height, so take the time to get these settings correct. Battery placement is toward the front of the chassis.

Does the XX-4 have a weak spot?

Many new XX-4 owners quickly learned that their kits had one fatal flaw—the front bulkhead, to which the lower suspension arms are attached. During certain types of crashes, if there's enough force exerted on a front wheel, the bulkhead might literally shatter.

This problem had plagued the folks at Team Losi during their development and testing of the XX-4, but they thought it had been fixed. As soon as they learned about the relative fragility of the bulkheads, they acted quickly. They fixed the problem by molding the bulkhead out of a slightly more pliable material that "gives" a little more during crashes. The new bulkheads are now standard in the XX-4 kit, and to support R/C'ers who bought one of the initial kits, Losi has sent new bulkheads to dealers to be given, free of charge, to XX-4 owners.

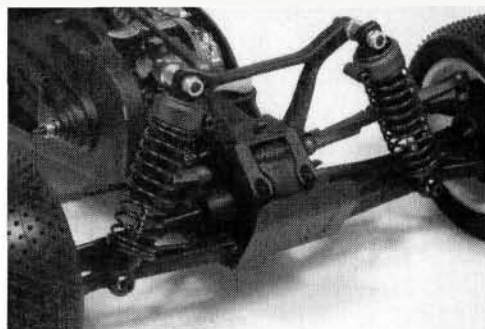
My XX-4 had also suffered from a broken bulkhead (see "Performance" sidebar), but I haven't had any problems since I installed the new one.

They fixed the tie rods!



If you read our review of the Losi XXT 'CR' truck back in the December '96 issue, you know that we really panned Losi for their then newly designed turnbuckles. We found that the turnbuckles stripped too easily; in fact, we didn't even use 'em on our tester!

As you can imagine, we caught some slack from Losi. But hey, those turnbuckles just didn't cut the mustard. Well, Pops Losi vowed to fix the problem, and we're happy to report that we now highly recommend the turnbuckles on the XX-4 and on all new Losi kits. Just look at the photos; we're still using them! Now, *that's* a testimonial [grin].



Likes

- Fully sealed drive train.
- Easy to build.
- Excellent instructions.
- Works on bumpy tracks.
- Easy-to-obtain (and inexpensive) parts.
- Priced lower than its competitors.
- Overall durability.

Dislikes

- Front shock tower and bulkhead are potential weak spots.

XX-4 On track

Team Losi took a helluva chance in making the XX-4. They designed a car that's totally different from anything else, for a racing class that's virtually nonexistent in the U.S. It's about time someone did this. The XX-4 may not win every pro race in which it's entered (but it has already won its fair share); it may not win the World Championships this month. None of this will matter. It's easy to build and easy to drive, and it works like nothing else on the tracks that *really* count—the bumpy ones that make up the majority of club tracks. On top of this, the fully sealed drive train requires minimal maintenance, and replacement parts are in plentiful supply and as close as your local hobby shop.

The XX-4 represents state-of-the-art R/C car design. I know that Gil Losi Jr. had wanted to make this car for a long time. It's here, it's that good, and four-wheel drive is back.

the Competition

	Yokomo YZ-10 Worlds	Schumacher CAT 2000	Tenth Technology Predator Intl., Team Car	Team Losi XX-4	Kyosho Laser ZX-S
Wheelbase	10.75 in.	11 in.	11.19 in.	10.7 in.	10.75 in.
Width (F/R)	9.265 in.	9.5 in.	9.75 in.	9.7/9.8 in.	9.21/9.45 in.
Weight	3 lb., 10.5 oz.	3 lb., 6 oz.	3 lb., 12 oz.	3 lb., 10.3 oz.	3 lb., 14 oz.
Diff type	Ball	Ball	Ball	Ball	Ball
Chassis	Graphite	Fiberglass	Nylon composite	Graphite composite	Carbon fiber
List price	\$650	\$529.50	\$670	\$499.95	\$849.99
Available at*	\$450	\$329.95	\$460	\$289.99	NA
Reviewed in	11/96	12/95	9/96	8/97	NA

*Prices vary with location.

*Addresses are listed alphabetically in the Index of Manufacturers on page 201.

thrash TEST

1/8 scale gas



High performance *without the high price*

Delta Force 3.5cc Engine Revealed

OFNA was kind enough to provide a brand-new Delta Force 3.5cc engine for my review. This engine is well-made and performs well; I had to give it some recognition.

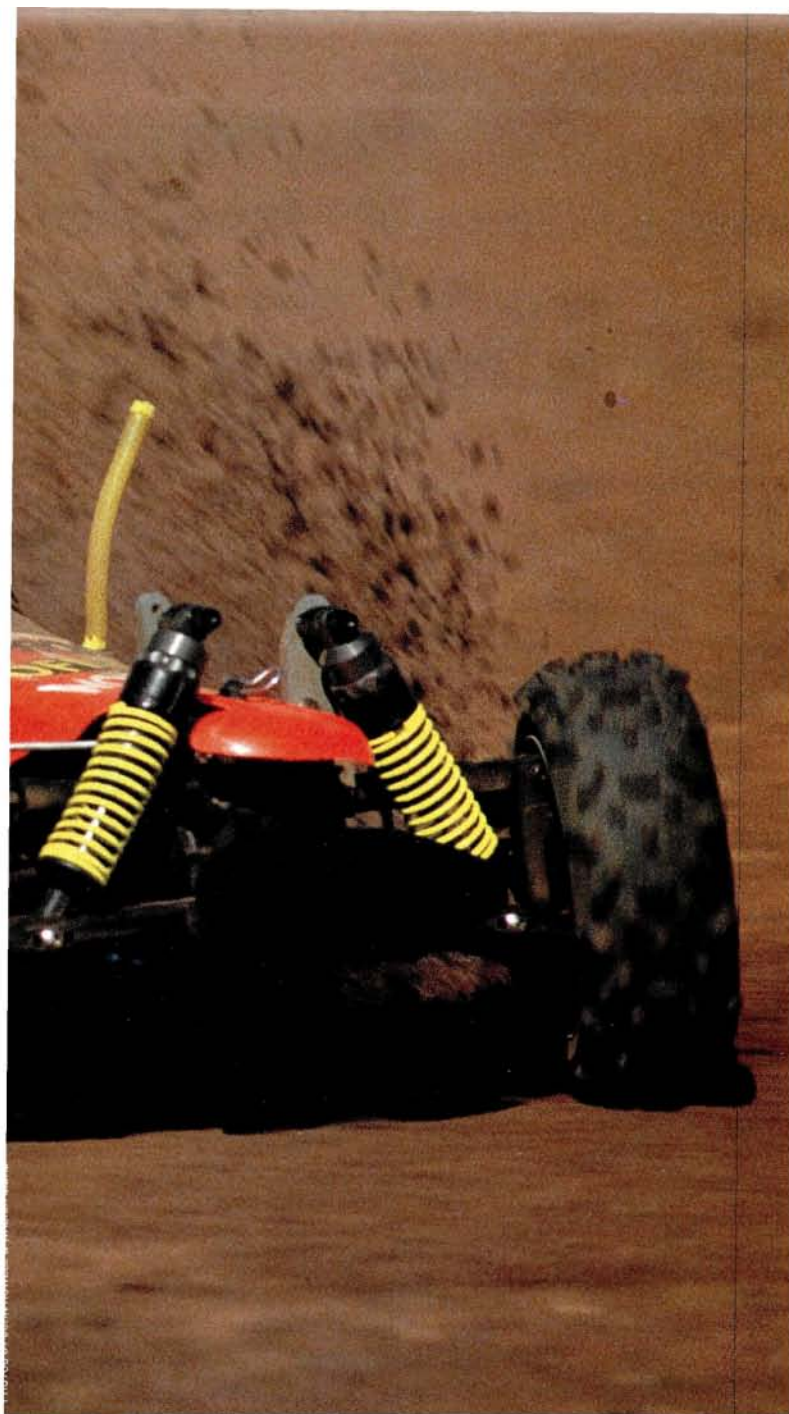
As you can see, it looks pretty cool. The black-anodized head has been machined twice to give it a two-tone look, and it provides more than enough engine cooling. The head button, or the "burn room," as it's referred to in the instructions, is separate from the head. Inside the crankcase, you'll find the eight-port sleeve with matching piston. You'll also find a beefy connecting rod going to the SG-style crankshaft. Of course, the crankshaft is supported by sealed bearings, and the



crankcase's beautiful casting makes it a work of art.

The carburetor, too, is of good quality. For serious, gas-guzzling power, it features a large (9mm) venturi, and a rubber boot protects the slide carb from dirt. The high- and low-end needles and the throttle rod bracket are made of a highly polished brass. The adjustments themselves are not too finicky to make, and that makes life a lot easier.

This is a high-performance engine that started right up for me and didn't give me any hassles. The pipe did rob it of some power, and that meant it had to be run at a much richer setting, but when I added a real tuned pipe, the "Force" was with me.



OFNA Ultra Worlds GT

by Greg Vogel

IN CONCLUSION, the OFNA* Ultra Worlds GT performed like a winning 1/8-scale off-road race car.

Oh! ... sorry; I got a little ahead of myself; and ahead of the competition is where you could be with OFNA's latest 1/8-scale off-road gas buggy racer. Compared with the Ultra GT, the Ultra Worlds GT displays an extensive redesign. Racing technology has been improving rapidly, and OFNA has again upped the ante in low-cost, high-performance gas racing.

I know you've already checked out the pictures of the new Ultra Worlds GT. Now take another look; see the manifold and pipe? Pretty nice, huh? Guess what? They come stock! Yup; that's a new chassis and new molded-nylon suspension components with improved geometry. Sounds dialed! Everything from its front/rear brakes to its new weight distribution makes this car worth checking when you're scoping the market for an 1/8-scale buggy. The best part? You won't have to re-mortgage your house to buy it.

KIT FEATURES

This is where we tell you to open the box, pull out the instructions and read them carefully. Well, pull out the instructions ...

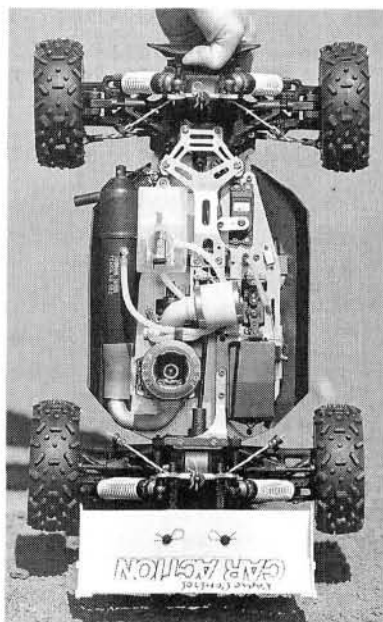
... and toss them aside to check out all the cool anodized parts! The radio tray, countersunk chassis and its stiffeners are all anodized in bright blue, and the shocks are hard-anodized a dark gray. The front of the 3.2mm-thick chassis has an added 6-degree kick-up—a new feature now being incorporated in many off-road 4WD racecars. This kick-up helps the car handle better through the type of rough terrain that usually makes 1/8-scale cars use the "plow" method. Extending from the chassis are new and improved suspension arms that have a 5-degree downward bend to increase that all-important suspension travel. The new uprights provide an additional 4 degrees of caster; this gives the tires more contact with the track during cornering, and this, in turn, allows the car to maintain aggressive steering. The aluminum hub carriers house the ball bearings that support the front universals.

Now let me back up toward the center of the car. The front and rear diffs feature heavy-duty, steel, planetary gears and the usual bevel-ring gears attached to the outside of the diff case. At first, the gears may seem tight, but they wear in, and the diff soon works smoothly. The front and rear diff housings are of a new design that allows you to remove the diff without having to disassemble most of the car. This makes diff maintenance a lot easier and much less frustrating.

The center diff has carbon brake disks attached to each end, and these disks can be adjusted independently to tailor braking performance. To reduce

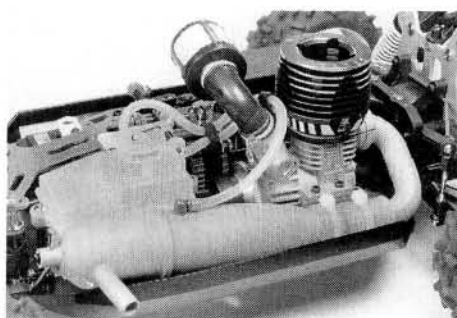
Engine Specifications

Displacement	0.211ci
Bore	0.65 in.
Stroke	0.63 in.
Rpm	2,500 to 38,000
Output	2.3bhp, 38,000rpm
Shaft type	SG
Carburetor	Delta 9mm
Part no.	52216
Turbo glow-plug conversion part no.	52012



Here's what the Ultra Worlds GT is all about. This car screams action!—no doubt, a well-thought-out, all-business platform. For the money, this is an absolute bargain.

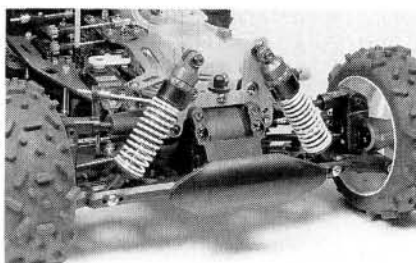
chassis roll, the servos and throttle-linkage components are mounted slightly to the right so that the engine and fuel tank could be brought closer to the chassis centerline. The weight has also been shifted more to the rear; moving the weight farther back and to the chassis centerline improves handling and jumping capabilities. The radio tray that holds the servos doubles as a chassis stiffener and contains a new waterproof receiver box. The rear suspension, too, has been tuned up to



The Delta Force 3.5cc is quite the performer. Although the kit includes a pipe, it's really more of an expansion chamber. The OFNA 31990 pipe (shown) is a true tuned pipe that really lets the engine breathe. The 125cc tank allows long run times.

provide superior handling. The suspension arms are angled down to gain more travel, and their rear pivot mount has a cam-like pin holder that, when twisted, adjusts toe-in from 1 degree to 1.5 degrees.

Once again, I got a little ahead of



A look at the front end of the Ultra Worlds GT. Hard-anodized shocks, universal-joint drive shafts, heavy-duty aluminum shock tower and aggressive off-road tires—all standard issue. Inside the gear case, you'll find a heavy-duty planetary gear diff with spiral-cut gears.

FACTORY OPTIONS

- 2-speed transmission—part no. 35001.
- Bearing servo shafts—31130.
- Torque-sensing diff—31320.
- Aluminum wing supports—31210.
- XX-pin tires—86091.
- O-ring pistons—32039.
- Various pistons—32235.
- Red springs—32330.
- Yellow springs—32340.
- Aluminum diff case—31321.
- Aluminum center mounts—31060.
- Aluminum servo arms—31220.
- Heavy-duty steel bevel—31010.
- Heavy-duty steel spur—31040.
- Delrin spur—31050.
- Aluminum CNC fuel filter—10165.
- Aluminum motor mounts—31190.
- Aluminum arm holder set—31171.
- Aluminum front tower—36501.
- Aluminum rear tower—36502.
- Foam cover—10031.
- Colored air-filter tubes—10027 (yellow); 10028 (pink); 10029 (blue).
- SG clutch-nut kit—10098.
- Rear aluminum bones—31260.
- CVD center drive—34051.
- CVDs front and rear—30072.
- Graphite brace—31270.
- Graphite radio plate—31280.
- Colored pipe-to-manifold joints—10180 (blue); 10182 (pink); 10183 (yellow); 10184 (turquoise).
- Aluminum front rear upper holder—36505.
- Aluminum front back holder—36504.
- Aluminum rear back holder—36506.
- Aluminum front lower holder—36503.
- Colored star wheels—86045 (white); 86047 (yellow); 86044 (red); 86046 (lime).

Building & Setup Tips

The instructions are geared toward people who are already involved in R/C and are interested in 1/8-scale off-road race cars. They include well-drawn pictures, so even if this is your first attempt, you shouldn't find building the car overly difficult. If you do have a problem, stop where you are and contact the distributor. It's better to stop and find the right answer than to go ahead and possibly do irrevocable damage.

• As when building any other gas car, you must use threadlock. I used a little on all the screws that make contact with metal, and I still had screws vibrate loose; in fact, I ended up rebuilding the car, but this time, I applied threadlock not only to the screws, but to the screw holes as well.

• The kit doesn't include diff fluid. To start, I used a combination of OFNA lubricants for the diffs—a 50:50 mixture of 600f high-temperature diff lube and diff lock lube. This sticky concoction works well when you're a beginner, but if you're really serious about racing, you may want to pick up some silicone fluids like the ones from Kyosho*. Try 5,000WT in the front and rear diffs and 10,000WT in the center.

• The shocks and diffs have rubber O-ring exit seals. Use RCPS* Green Slime on these rings to reduce stiction and prevent the parts from leaking.

• When you mount the servos on the radio tray, use the rubber grommets included with the servos. This will reduce the chance of glitching caused by engine vibration. And wrap your receiver in foam before you install it in its box.

• Put small pieces of fuel tubing between the brake pads to help separate them after braking. If you don't, they may hang up on the threads of the screws.

RECOMMENDED RACING SETUP

Front suspension

- Shock pistons—Teflon™ 2-hole.
- Shock oil—Associated* 40WT.
- Springs—OFNA soft Yellow springs.
- Shock mount—stock positions.
- Toe-in/out—0 degree.
- Camber—2 degrees negative.
- Camber links—stock.

REAR SUSPENSION

- Shock pistons—Teflon™ 2-hole.
- Shock oil—Associated 40WT.
- Spring—OFNA soft Yellow spring.
- Shock mount—stock.
- Rear arm mount—1.5 degree position.
- Camber—1 degree negative.
- Camber links—stock.

Differentials—50:50 temp and lock lube. Stabilizers (F/R)—attached. Ride height—front drive shafts level; rear drive shafts slightly above level.

myself! I forgot to mention a bunch of other neat features: a full set of ball bearings; front and rear swaybars; flip-top fuel tank; aluminum radio posts; adjustable steering rods; dirt shields; racing tires; tri-level wing; and three-shoe clutch.

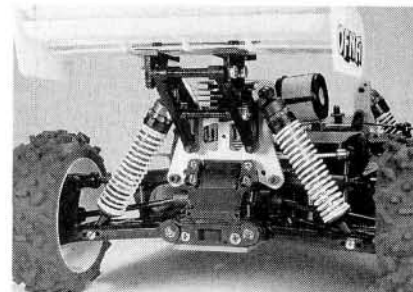
TEST GEAR

I planned to do some serious racing, so I wanted to install the best engine OFNA has to offer—the Delta Force .21 (see the sidebar, “Delta Force 3.5cc Engine Revealed”). An Airtronics* 94151 servo controls steering, and a Futaba* 9304 yanks the throttle and slams the brakes. I also use my JR Propo* R-756 radio and a new Novak* Mercury receiver, which is small enough to fit into the radio box

well. This may seem like a wacky combination, but it works well. I power the receiver with a Dynamite* 5-cell receiver pack and chose Dynamite Blue Thunder 20-percent-nitro fuel.

PERFORMANCE

I’ve already mentioned my plan for “serious racing,” so, of course, I took this 1/8-scale nitro machine to my favorite “local” race track—R/C Madness in Enfield, CT (an hour and a half away, but who’s counting?). Track owner Chris Marcy had just spent countless hours on setting up



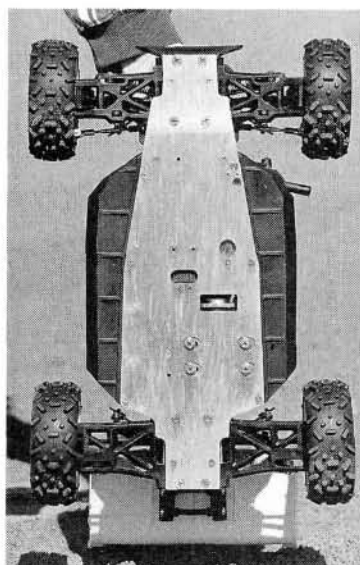
You'll see many of the features found up front back here, too. Check out the suspension-arm mounts; rear toe-in and anti-squat may be adjusted by changing the rear pivot block. Cool bi-level wing.

Likes

- Packed with features that are usually options.
- Chassis kick-up, weight distribution and placement ensure great handling.
- Manifold, pipe and three-shoe clutch included.
- Easy to work on; highly tunable chassis.
- Being able to win against people who spent twice as much for their cars.

Dislikes

- Diff fluid and tire foam not included.
- Some parts become brittle in cold weather.



The flip side tells another story: lots of abuse. Check out the front kick-up and molded chassis sides. Yes, those tires are standard issue.

Specifications

SCALE 1/8
LIST PRICE \$535.95

DIMENSIONS

Length overall 19.2 in. (480mm)
Wheelbase 12.92 in. (323mm)
Width (F/R) 12.12 in. (303mm)

WEIGHT (gross, RTR) 7 lb., 8 oz.

CHASSIS

Type 3.2mm stamped plate w/6-degree kick-up
Material Blue-anodized T-6 aluminum

DRIVE TRAIN

Type Shaft-driven 4WD
Primary 14-tooth clutch bell/51-tooth spur
Transmission Front universals/rear dogbones
Differential(s) 3 sealed diffs with steel gears
Bearings/bushings Ball bearings

SUSPENSION (F/R)

Type 4W independent w/lower arm and upper wishbone
Damping Large-volume, oil-filled super shock

WHEELS (F/R)

Type One-piece molded 5-spoke
Dimensions (D&W) 3.14x1.65 in.

TIRES (F/R) Block-pin style

POWERPLANT

Engine Delta Force 3.5cc
Pipe Stock expansion pipe
Carb 9mm slide

an excellent course—everything from tabletop jumps to doubles to a crazy whoop section.

At first, I was intimidated by the power and speed of these big 2hp buggies, but as soon as I started the car and put it down on the track, I seemed to have an innate ability to drive it. The stock setup (straight from the instructions) worked very well and was a great starting point for further adjustments. With the high-performance engine and the gearing provided, the car accelerated extremely well. But I still thought it could go faster; here's why: the type of pipe included with the kit is actually an expansion chamber, and it acts more like a muffler than a “tuned” pipe. As a result, the stock pipe made the car loud and prevented me from leaning

(Continued on page 162.)

THINGS YOU'LL NEED

- 2-channel radio system (preferably with high-torque servos).
- Starter or starter box.
- Glow fuel and glow igniter.
- .21 (3.5cc) engine.
- Diff fluid, threadlock and paint.
- Battery pack to power the radio system.
- Tools.
- After-run oil (highly recommended).

the Competition

	OFNA Ultra Worlds GT	Mugen Super Athlete	Kyosho MP-5	Thunder Tiger Mirage Pro
Wheelbase	12.9 in.	12.68 in.	12.625 in.	12.5 in.
Width (F/R)	12.12 in.	9.92 in.	11.875 in.	12.4/12.5 in.
Weight	7 lb., 8 oz.	7 lb., 4 oz.	7 lb., 2 oz.	7 lb., 12 oz.
Diff type	Planetary	Planetary	Miter	Planetary
Brakes	Dual disk	Dual disk	Dual disk	Dual disk
Exhaust	Header and pipe	Tuned pipe	Not included	Header and pipe
Price	\$535.95	\$749.99	\$699.99	\$499.99
Available at*	\$329	\$500	\$549.99	\$349.99
Issue reviewed	8/97	7/97	12/95	10/96

*Prices may vary with location.

thrash
TEST

1/10 scale electric



Shown here at the '97 Florida/NHRA Gator Nationals, Eddie Hill's Pennzoil AA Top Fuel dragster awaits its next qualifying run. A former champion in both drag boat and Top Fuel dragsters, Hill's bright yellow nitro slingshot was the inspiration for the detailing of the Bolink body.

Fully Loaded Land Missile

PHOTOS BY RICK EYRICH

BOLINK Econo Rail

by Rick Eyrich

WELL, BOLINK*, it was about time! After introducing your ultra-popular Digger, Legends and Sport 2000 series cars, you finally got around to putting out some Top Fuel design drag vehicles for the R/C masses! Yup, as well as being a leader in on-road oval racing, the Lawrenceville, GA, company has developed an inexpensive and well-designed AA Fuel R/C dragster—the Econo-Rail—for the first-time drag enthusiast.

KIT FEATURES

- **Chassis.** OK, hold up, you long-time drag racers out there: this isn't the Lexan-chassis dragger Bolink used to produce; this is an all-new R/C slingshot. A combination flat fiberglass-and-graphite two-piece chassis is standard issue on this over-2-feet-long rail! The rear graphite section holds the twin aluminum motor and axle mounts while the longer fiberglass front piece holds the front axle bits.

TEST GEAR

- Novak Cyclone ESC.
- Futaba® S148 standard steering servo.
- Novak FM 3-channel receiver.
- Futaba PCM 1024 transmitter.
- Trinity Speed Gems Onyx 14-turn double modified motor.
- 7-cell SCR1400 Sanyo® pack.
- Sermos®/hard-wired.

One Fast Eddie!

For those RC'ers who enjoy NHRA drag racing, the Bolink Econo-Rail's paint/graphics layout will look familiar! By using regular Pactra® Daytona Yellow Lexan paint and Autographics® decals, I created a pseudo-replica of Eddie Hill's Pennzoil Special AA Top Fuel Dragster for this "Thrash Test."

Hill began competing on the NHRA circuit after a great drag-boat racing career that included a ton of victories and championships. This winning streak carried over to Hill's nitro-car-racing effort with NHRA national wins, time/speed records and a Top Fuel Dragster world championship year.

So far, 1997 hasn't been a great year for the Hill/Pennzoil team because of the departure of longtime crew chief Fuzzy Carter, many powerplant blowups and a scarcity of elimination-round wins. But as is the case in pro-class drag competition, it takes only one good pass to change a team's fortune for the better.

The same holds true in 1/10-scale IEDA-type racing. So never give up on your DC-powered drag vehicle; Eddie hasn't given up on his nitro burner!

The fiberglass-plate front axle uses standard Bolink steering blocks and stub axles while a neat bellcrank/pushrod setup controls the front-wheel steering action. This system is necessary because of the vehicle's extreme length and the distance between the axle and steering servo. The only suspension found on the rail resides on the front axle via springs, like the ones on the company's Legends cars.

• **Drive train.** As is the norm with most R/C drag cars, the Bolink has no diff, gearbox, etc.; it's direct drive right from the motor pinion to the rear wheels.

A stainless-steel axle, 48-pitch spur gear, Oilite bushings, nylon hubs and twin axle uprights (with a ride height/traction adjuster) are the drive components. Because of this simple drive assembly, building time is minimal, and this should draw raves from many R/C'ers!

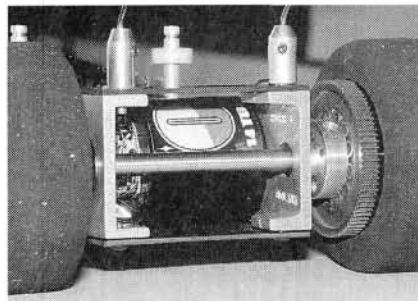
• **Wheels and tires.** Standard Bolink foam tires ride on the car's chromed rear wheels, and the shiny aluminum front wheels sport O-ring "tires."

Oilite bushings are standard on the front wheel/axles, but I added the full Bolink ball-bearing set to the chassis. After mounting all four wheels on the frame, I checked each one for wobbles and found that they all ran straight—good stuff!

SPECIFICATIONS

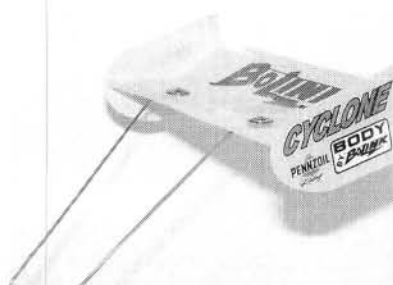
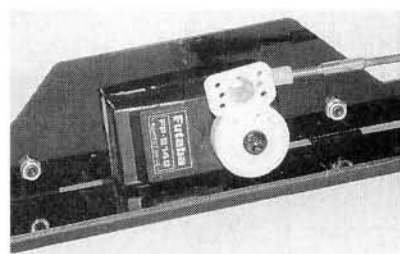
SCALE	1/10	Bearings/bushings	Oilite bushings
LIST PRICE	\$99.95		
DIMENSIONS			
Length overall	27.15 in.	SUSPENSION (F)	Fiberglass axle/kingpins
Wheelbase	23.85 in.	Damping	Springs on kingpins
Width (F/R)	4.5/7.35 in.		
WEIGHT (gross RTR)	2 lb., 9 oz.	WHEELS (F/R)	
CHASSIS		Type	Aluminum/one-piece plastic
Type	Plate/sub-frame	Dimensions	
Material	Fiberglass/graphite	(DxW)	1.6x0.19/2.5x2 in.
DRIVE TRAIN		TIRES (F/R)	Rubber O-rings/Bolink foams
Type	Direct drive		
Primary	Pinion/spur	ELECTRICS	
Transmission	None	Motor, battery, ESC	Not included
Differential(s)	None		
Slipper clutch	None		

Right: the 7-cell SCR1400 pack shown here is at the legal cell limit for IEDA Econo-Dragster-class racing. Most racers use the smaller 1000SCR cells to reduce weight, but for beginners, the SCR1400s will work fine.



Left: insufficient clearance between the motor and graphite chassis sub-frame made it tough to install the Trinity modified motor. Some thin washers separated the twin aluminum uprights enough for me to slip the motor into place.

Right: the Futaba steering servo resides inside the car's chassis brace, and a long pushrod connects it to the front-steering-bellcrank setup. Most servos will fit the rail's brace opening with a bit of file work.



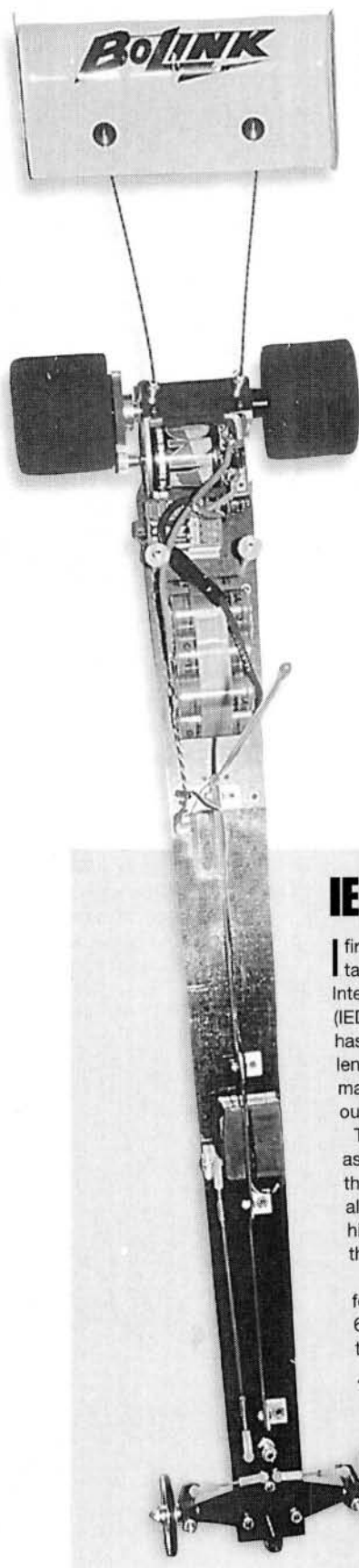
Left: a Bolink Superspeedway wing found its way onto the dragster. Once I had added home-made Lexan side dams to the wing, regular piano wire and a pair of BRP wing mounts completed the package.



Above: a Trinity Speed Gems Onyx motor powers the Bolink. The Novak Cyclone ESC transfers the cell voltage to the 14-turn double modified motor.



Building & Setup Tips



Because of the Bolink's basic layout, you'll need to do only a few things in addition to the steps on the setup sheets. Mount your batteries as far rearward as you can to improve rear tire traction. You can also increase the grip by adding a rear wing; I used a Bolink Superspeedway unit with homemade side dams. To hold it in place, I attached BRP* wing mounts to the motor/axle mounts with threaded 2-56 rod pieces.

• I replaced the stock steering rods and clamps with a

Great Planes* ball link set (part no. GPM03841) to reduce play in the steering. I used 1/16-inch piano wire to connect the servo and bellcrank, and I tweaked the maximum amount of caster into the front axle.

• If you use a large-can motor on your Econo-Rail, be prepared to add spacers between the motor/axle plates and the sub-frame. My Trinity motor needed a 3/32-inch washer gap between it and the graphite sub-frame, but some stock motors may require another 1/16 inch to clear.

• A standard-size steering servo will fit the Bolink chassis (with a bit of file work on some models). To fit the Futaba S148 to the dragster's brace opening, I needed to take only 1/8 inch off both the width and height.

• When I added the ball-bearing set to the front wheels and rear axle, I noticed some play in the fit. I used Loctite* Bearing and Stud Lock to cure the glitch, and the bearings have stayed firmly attached ever since.

THINGS YOU'LL NEED

- Two-channel radio.
- Steering servo (standard or smaller).
- Electronic or microswitch/servo speed control.
- Six- to 10-cell battery pack (IEDA requirements).
- Battery charger.
- Paint for Lexan body.

IEDA Econo-Rail Notes

I firmly believe in following the path of least resistance, so I set up this Econo-Rail to the International Electronic Drag Racing Association's (IEDA's) Econo Dragster specs! This DC drag class has the following criteria: 30-inch or less chassis length, maximum of 7 cells, one production ferrite magnet motor, a realistic body shell and a 36-ounce minimum RTR weight.

The Bolink rail's chassis and body met the specs, as did my SCR1400 pack, Trinity powerplant and the rest of the car's components. IEDA rules also allow the Econo Dragsters to be up to 8 inches high, so I added a Bolink Superspeedway wing to the chassis' rear motor mount area.

These 1/10-scale slingshots currently run 132 feet in around 2 seconds and at speeds over 63mph. So while they may be called "econo," they sure haul tail at high-dollar speeds!

The Econo's 24-inch wheelbase gives you the AA nitro/fuel rail scale and its inherent straight-line stability. OEM features of this latest addition to the Bolink R/C fleet include a fiberglass front axle, bellcrank steering, graphite sub-frame and twin aluminum motor/axle stands.

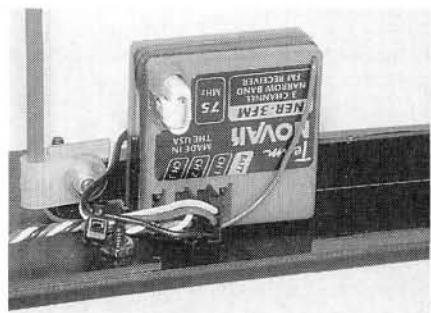
TEST GEAR

Novak's* Cyclone ESC and 3-channel FM receiver found their way onto the Bolink. I installed the ESC next to the motor mount and the receiver on the forward plate. Installing the ESC and radio gear as far apart as I could reduces the potential for glitching.

I slipped a Trinity* Onyx modified motor and a 7-cell SCR1400 pack in front of the rear axle. The 14-turn double proved tough to mount on the chassis, as there was no clearance between it and the graphite sub-frame. Some thin washers between the uprights and chassis solved the space problem, and the basic Bolink rail was ready for some straight-line testing!

PERFORMANCE

Because this was my first experience with a 2-foot-long R/C dragster, I took some extra time to ensure that the Econo-Rail tracked as straight as it could! Some careful tweaking of the steering/wheel toe and many quarter- and half-speed runs



Left: I installed the 3-channel Novak receiver well forward of the motor, ESC and battery to reduce the possibility of glitching. Its vertical position also improves radio reception, and it easily cleared the Lexan body shell.

RACING CELLS

"WE LOVE TO WIN"

SANYO

RC-2000

6 CELL PACKS

370-379 PKS 39.75

380-389 PKS 47.00

390-399 PKS 57.00

"SPIKED" PACKS

THESE CELLS ARE 1.15 TO
1.16 VOLTAGE WITH LOW
IR

370-379 PKS 49.00

380-389 PKS 57.00

390-399 PKS 67.00

THUNDERBOLT MOTORS

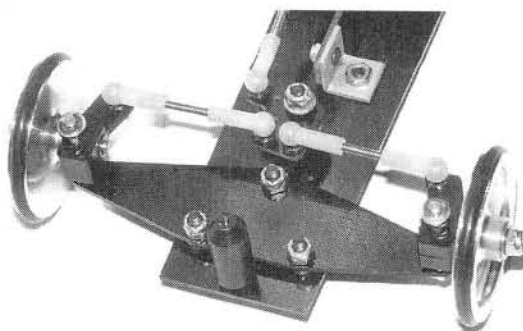
EPIC TUNED BLACK
23.75

EPIC TUNED SILVER
23.75

WORLD CLASS BATTERIES

8021 JAMES CT
NIWOT, CO 80503
PH 303-652-3038
FAX 303-652-2369
MC-VISA-COD

BOLINK ECONO RAIL



The Econo-Rail's fiberglass front axle can be tilted front-to-back to alter the front kingpin's caster angle. In this area, I added some Great Planes ball links and a new Raceway Mfg. body post.*



Likes

- Has many features that are typically found on more expensive drag cars.
- Easy-to-adjust front caster angle.
- Rear axle ran true and smooth from the start.



Dislikes

- Minimum motor/chassis clearance.
- Ball bearings loose on front wheels and motor/axle mount.
- Wimpy front body-mount post.

FACTORY OPTIONS

- Ball-bearing set—part no. BL-5451.
- Wing mounts—BL-5190.
- Wing kit—BL-2723.

Staying Stuck Traction Tips

OK, you novice drag racers, listen up! Normal concrete and asphalt surfaces will not allow you to get enough grip without help!

Most IEDA national events are held on smooth tarmac that has been treated with a sugar water solution to increase traction. On top of that, many dragsters add traction compound to their rear skins to further enhance tire bite.

These traction compounds range from Paragon's* Ground Effects to Trinity's Zip Grip to Koford's types for slot cars, but for most fun dragsters, sugar water is good enough. A cheapo pump yard sprayer is all you need to apply the solution to your local "strip"; vary the mixture to suit the condition of the surface.

Fresh asphalt and rough concrete (the best for these cars) might require a solution that is 30 to 50 percent sugar, so experiment until you find the best "brew" for you!

Note: first and foremost, always get permission before you spray any surface with sugar water. You may lose your drag strip if you don't! And second, be aware that this sweet spray can attract ants, so keep close tabs on your ham sandwiches!

got it in the ballpark. Sugar water on the asphalt and some slot-car traction compound on the Bolink's foam rear tires provided starting line/takeoff traction.

I also found myself reducing the steering servo rate more and more, and this is both good and bad. The disadvantage is that a low servo rate means you can't drive out of a bad situation, but because of the reduced steering, you probably won't get into a jam anyway. Plus, I threw a lot of caster onto the front axle to reduce the possibility of the car darting from side to side at high speeds.

As for speed, the Trinity-powered Bolink was capable of making 132-foot runs (1/10-scale quartermile) in the high 4-second times; this ain't bad for an AA rail first-timer! With some additional gearing, traction and motor work (plus more drive time), the Econo-Rail should produce racing-level speeds and times without difficulty.

FINAL THOUGHTS

When you consider that the complete kit costs less than a C note, the Econo-Rail is a true R/C bargain. Plus, this isn't a wannabe electric rail dragster! It's a full-blown, full-race vehicle capable of running with any similar drag racer on the market today.

And as with the Econo-Rail's Legends cousins, you need only a suitable parking lot and some sugar water to enjoy it. You don't need a box of bottles of shock oil, an endless supply of super-cells, or even an abundance of R/C car savvy to thoroughly groove on electric 1/10-scale drag racing.

Few R/C vehicle builders know how to combine fun and function like Bolink, and their new Top Fuel replica has both of these things in spades!

**Addresses are listed alphabetically in the Index of Manufacturers on page 201.*

One Feroo



THUNDER TIGER USA, INC.

2430 LACY LANE, SUITE 120 CARROLLTON, TX 75006 U

TEL: (972) 243-8238 FAX: (972) 243-8255

<http://www.tiger.com.tw>

Blows Tiger

Introducing the new Mirage VSPEC. On top of the championship winning platform, we narrowed it 5mm, and gave it a 7 degree kick-up chassis, super narrow radial wheels/tires, and beefed up narrow suspension geometry front and back.

This competition chassis is available without engine (w/o tune pipe). For the aspiring 1/8 racers, the Mirage VSPEC is also available with our racing PRO-21B-R(P) engine (or the pull-start PRO-21BX-R(P)) and IFMAR spec. tune pipe.



MIRAGE VSPEC
1/8 Scale Nitro-Powered 4WD Buggy

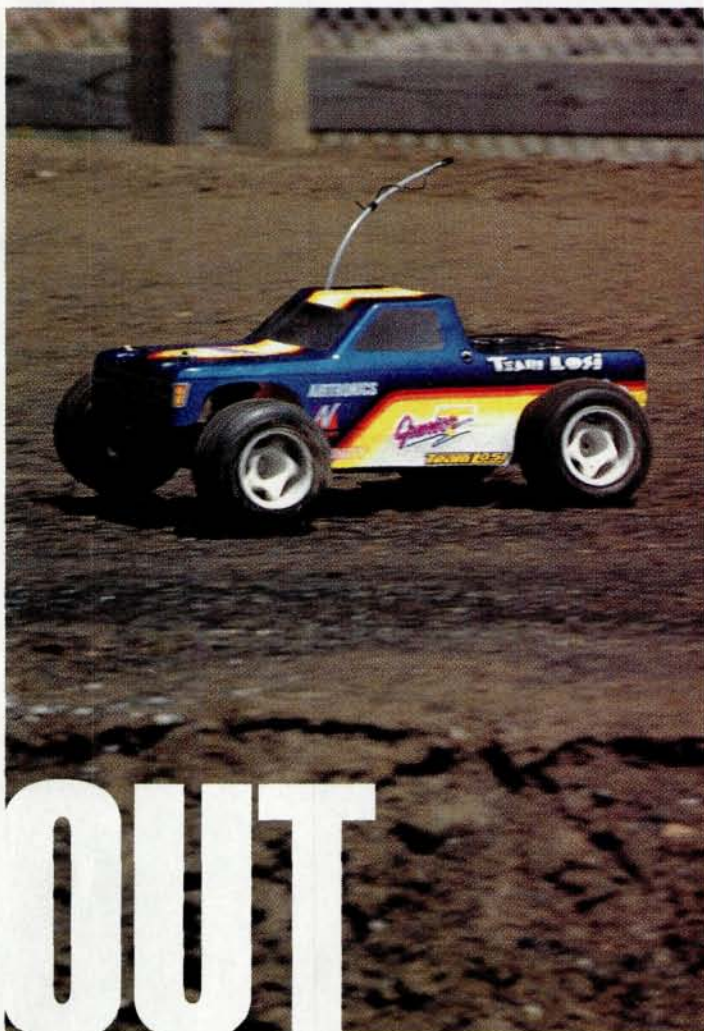
Race-Ready Pickups You Can Afford



Budget Race Truck

by George M.
Gonzalez

SHOOTOUT



POTENTIAL R/C truck racers are often discouraged by the prices of the vehicles—especially when they add in the cost of all the peripheral equipment that's needed to keep them rolling. Perhaps that's why Associated Electrics, Team Losi, Kyosho, Tamiya, Traxxas, MRC and Schumacher have all gone to great lengths to produce high-quality, entry-level (read: less expensive) stadium racing trucks that come with just about everything you'll need to get started. Chances are, if potential hobbyists are pointed in the right direction, they'll buy a high-quality product that will leave them with a positive feeling about the hobby.

With that in mind, to show you what's available, we gathered up every entry-level stadium truck we could get our hands on for this shootout. We subjected the trucks to the rigors of backyard bashing as well as to all the torment a large, hard-packed, supercross-style racing track can dish out. If you're thinking about getting started in R/C or you're ready to add a stadium truck to your collection, read on to find out which entry-level truck is right for you.

RACE TRUCKS ON THE TRACK

R/C Madness in Enfield, CT, is the track where the *Car Action* editors do most testing. Every Sunday, many talented racers gather there to race, talk and have a good time. The large outdoor track is rock-hard and riddled with obstacles. On "testing" Sunday, I left my high-dollar racing vehicles at home and took along the three Category 1 "shootout" trucks: Associated's RC10ST and RC10T2 Sport and Team Losi's Double-XT Bushing.



The racing schedule includes three qualifiers and one Main. I decided to race each truck once during the qualifying heats and then, in the Main, race the one with which I had turned the fastest time. I started with the RC10T2 Sport (equipped with a mechanical speed control and sport battery pack). I didn't have a chance to practice, so I decided to just take it easy and get used to the truck's handling characteristics. In other words, I wasn't going to challenge any of the other racers.

Heat 1: a pileup in the first corner split the field, and my RC10T2 Sport squeezed right through the middle to take the lead. I never looked back and was

(Continued on page 79)



The Rating Game

We tested nine trucks from seven manufacturers. Because their features and prices differ so much and they're available in various stages of completion, it's difficult to "compare apples with apples." For this reason, we sorted the trucks into three categories:

1 Sport Racers

- Traxxas Rustler
- MRC MT-10S
- Schumacher Club 10 Storm
- Team Losi Junior T

With basic racing features and upgradeable platforms, these trucks are suitable for backyard bashing and mild club racing. To race competitively, however, they'll need some upgrades.

2 Backyard Bashers

- Kyosho Outrage ST
- Tamiya Stadium Thunder

With the proper tires, these trucks will perform quite admirably on an off-road track; however, they either do not offer enough tuning features or were not built to take the punishment of heated competition. For this reason, these trucks are more appropriate for general sport running and backyard bashing. Keep in mind, however, that all the trucks in this category are hobby-quality R/C products and are not to be confused with toy R/C cars.

3 Racing Trucks

- Team Associated RC10T2 Sport and RC10ST
- Team Losi Double-XT Bushing

These trucks offer the features needed for racing and were built to take the abuse of heated competition. Right out of the box, we think they're capable of winning stock-class trophies.



1 Sport Racers

MRC MT-10S

Three-gear racing tranny, adjustable ball diff, slipper clutch, adjustable upper camber links, oil-filled shocks, racing-style bellcrank steering system and nylon-composite suspension components—not features usually found on

entry-level trucks, but they are standard on the MRC MT-10S. With that in mind, I guess it's safe to say that this truck comes loaded. The MT-10S also comes with a 540 motor and forward-and-reverse, 3-step speed control. Add that the MT-10S can be ordered RTR with a Futaba Magnum Sport radio system installed, and you have the makings of a winner.



- Unassembled kit—part no. RC100; street price \$87.99.
- RTR with a radio installed—part no. RC101P; street price \$166.99.

Likes

- Loaded with racing features.
- Excellent instructions.
- Ball diff and slipper clutch are included.
- Adjustable front and rear camber links.
- Easy to build and maintain.
- Great low price.

Dislikes

- Some assembly steps (particularly in the tranny department) might require the assistance of a seasoned hobbyist.
- Plastic bushings throughout.
- Body seems a little large compared with those of the other trucks.

Traxxas Rustler

The Rustler's super-tough fiber-composite chassis and suspension components make it practically indestructible. With features like fully independent suspension with ultra-smooth, big-bore shocks and a smooth 3-gear tranny with universal sliders, the Rustler is sure to launch many racing careers. It comes with a fast, 21-turn 540 motor and a rotary-type, forward-and-reverse 3-step mechanical speed control. Traxxas also offers a full line of hop-ups that can transform the Rustler into a serious competitor. Don't feel like building? Well, the Rustler is available RTR with a Traxxas radio system installed.

The Rustler won the *Car Action* seal of approval by a very narrow margin over the Team Losi Junior T. In our opinion, the Rustler offers more bang for the buck. It's also very rugged and took more of a beating than it deserved. All you have to do to make it race-ready is add a slipper clutch, adjustable camber links and suitable racing tires.

Likes

- Built like a brick outhouse.
- Many built-in racing features.
- Impressive list of hop-ups.
- Excellent instructions.
- Excellent factory support.
- Super-tough, low-CG chassis.
- Silky-smooth racing-style bellcrank system (servo-saver included).
- Can be ordered RTR with radio gear installed.
- Zippy 21-turn 540-size motor.
- Oilite bushings used on all critical driveline components.

Dislikes

- Plastic motor mount.
- Camber links aren't adjustable.
- No on/off switch.



- Unassembled kit—part no. 3701; list price \$160, street price \$85.99.
- RTR with radio—part no. 3710; list price \$270, street price \$151.99.

Team Losi Junior T

Even though the Junior T has been around for a long time, it's still an excellent choice for a first race truck. It's based on the LX-T racing truck, so you could say it has racing roots. Team Losi has reduced its price so much that it now carries a lower price tag than the other trucks tested. Keep in mind, however, that it does not include a motor and speed control. Its features include a rugged Stiffezell chassis and suspension components, aluminum shocks, a ball-diff-equipped tranny and a racing-style bellcrank steering system. The Junior T is an excellent performer, and with very few hop-ups, it can be very competitive.



- Part no. A-0061; list price \$149.95, street price \$85.99.

Likes

- Rugged chassis (perfect for first-time racers).
- Upgradeable chassis.
- Ball-diff-equipped tranny.
- Aluminum shocks.
- Adjustable camber links.
- Great handling for a budget truck.
- Great price.

Dislikes

- No servo mounts provided.
- "Shoe-box" truck body.
- Does not include motor and speed control like the rest of the trucks in this category.

Schumacher Club 10 Storm

This worthy performer can be driven in club-level races. Its features include aluminum-alloy chassis, efficient 3-gear tranny with adjustable ball diff, oil-filled shocks and fiberglass shock towers. Add to this impressive list a forward-and-reverse 3-step mechanical speed control and a 540 motor, and you're ready for some serious racing.



- Part no. U443V; list price \$189.50, street price \$118.44.

Likes

- Aluminum chassis.
- Supersmooth tranny with adjustable ball diff.
- Very smooth plastic shocks with click-and-tune internal shock pistons.
- Comes with motor and 3-step speed control.
- Impressive list of hop-ups.

Dislikes

- Fixed upper links (camber can't be adjusted).
- Wheel-fastening methods could be improved.
- Unusual bellcrank system does not have a servo-saver.
- Supplied motor is wimpy.
- Parts may be a little harder to find than those of some of the other trucks featured.



2 Backyard Bashers

Tamiya Stadium Thunder

This takes the cake in the looks department—one flashy-looking truck. Based on an all-new long-suspension-travel chassis design, the Stadium Thunder has an ABS plastic-tub chassis, extra-long oil-filled shocks, extra-long suspension arms, a low-power-loss tranny, nylon and ABS plastic suspension components, aggressive racing tires and a great-looking truck body. The truck also includes a 540 motor and a forward-and-reverse 3-step mechanical speed control. The Stadium Thunder is sure to turn heads when it tackles those urban obstacles.

All the editors were impressed by the Thunder's surefooted handling and smooth power delivery. It negotiated turns with accuracy, went through the five-jump rhythm section without losing its composure and got muddier than any of the other trucks we tested.

■ Part no. 58181; list price \$220, street price \$134.99.

Likes

- Cool-looking stadium-truck body with complete decals.
- Excellent instructions.
- Fantastic handling for a budget race truck.
- Fun to build and drive.
- High-quality materials throughout.
- Comes with 540 motor and 3-step mechanical speed control.
- Wheels will accommodate standard 2.2-inch off-road tires.

Dislikes

- Limited gearing choices.
- Expensive for a "budget" truck.



Editors' Picks

from Categories 1 and 2

"I had a JRX-T and then an LX-T, and I knew how durable they were. In my opinion, the **Team Losi Junior T** provides close to a racing truck performance at a price that's unbelievable. Gotta love the "shoe-box" body; use a reversing speed control, and they won't be able to tell whether you're coming or going!"

—Masi

"I prefer the **Tamiya Stadium Thunder**. It's rugged, well-designed and has the high-quality finish that I expect from Tamiya. It comes with the best-looking body of the bunch, and its stock tires and zippy stock 540 motor worked admirably out in the field. When we headed to the BMX track to torture the trucks, I privately thought that the Stadium Thunder wouldn't fare well; I was *dead wrong*. After running all of them for a while, I found myself asking who had the Tamiya and then telling him to hurry up and give it here, Bubba."

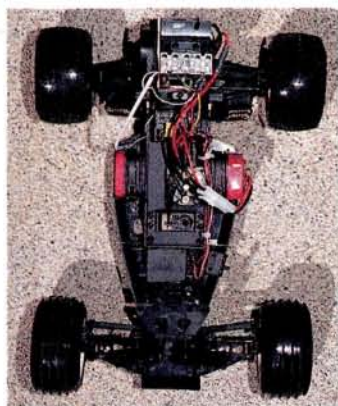
—Howell

"Right from the start, I felt very confident with the **Schumacher Club 10**—as if I'd been practicing with it all morning. Simply put: the truck went where I pointed it; it didn't "push," as stadium trucks so often do; and it wasn't "loose" at the rear, so it didn't ambush my efforts with sudden, unpredictable oversteer. The rear tires worked very well on our track, and the Schumacher's Club-10 overall handling could be said to be very neutral. A very relaxing truck to drive."

—Chianelli

"I chose the **Tamiya Stadium Thunder** not because of its price and features, but for its looks and performance. It looks awesome when it's negotiating a hairpin turn or 'skying' a tabletop jump. On the track we tested it on, I think it handled better than the other trucks; in fact, it handled so well that we editors fought over who would be the next to drive it. Yeah, we're a bunch of babies."

—Gonzalez



Kyosho Outrage ST

The Outrage ST is an easy-to-build, fun-to-drive stadium truck. With rugged suspension components and oil-filled shocks, the Outrage can jump curbs all day long. Because it's based on one of Kyosho's most popular chassis, parts are readily available at most hobby shops. The truck comes with a 540-size motor and rotary-type, forward and reverse, 3-step mechanical speed control. Kyosho also offers a complete line of cool hop-ups that will allow you to create a rather exciting sport-racing truck.

■ Unassembled kit—part no. KYOC0193; list price \$159.99, street price \$94.99.

Likes

- Supple suspension.
- Extremely easy to build.
- Excellent instructions.
- Plenty of hop-ups available.
- Clean, uncluttered chassis.
- Great low price.
- Good-quality tires.
- 2.2-inch wheels on all four corners.
- Racing-style steering bellcrank system with servo-saver.
- Oilite bushings on all major drive-train components.

Dislikes

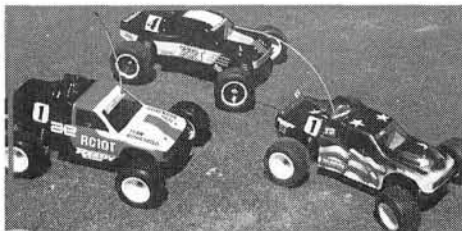
- Tranny is a little outdated.
- The truck is narrower than most racing trucks.
- Battery hold-down straps are cumbersome to use.
- Chassis could be a little more rigid (we noticed some flexing during our tests).
- Chassis underside has many nooks and crannies that are sure to collect dirt and debris.



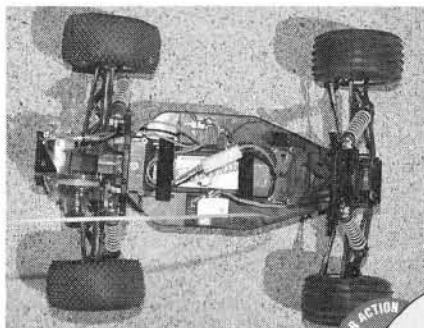
T3

Coming soon to a track near you





3 Racing Trucks



Team Losi Double-Xt Bushing

As its name implies, this is a bushing-equipped version of the national champ Double-Xt and should be considered a high-end entry-level truck. In fact, with a few factory hop-ups, the truck can be upgraded to full 'CR' specs. The XT features: a tough, lightweight Stiffezell chassis; aluminum body, oil-filled shocks; efficient 3-gear racing tranny with ball diff and slipper clutch; and a complete set of racing tires. The truck's suspension is also completely adjustable, so it can be tuned for any track. A racing truck body is part of the package, which can be ordered with or without a competition stock motor and a forward-and-brakes speed control.

The Double-Xt Bushing was awarded the *Car Action* recommended classification by an extremely narrow margin over the RC10T2. In fact, we almost decided just to call it a tie and get it over with. We eventually chose the XT because of one feature—its lower price.

■ With motor and speed control—part no. A008; list price \$249.95, street price \$128.99

■ Without motor and speed control—part no. A0081; list price \$229.95, street price \$118.99.

Likes

- Real racing features.
- Excellent instructions.
- Pro-level racing performance.
- Fantastic upgrade potential.
- Can be ordered with motor and super-smooth resistor-type mechanical speed control.
- Oilite bushings throughout.
- Aluminum shocks.
- Price.

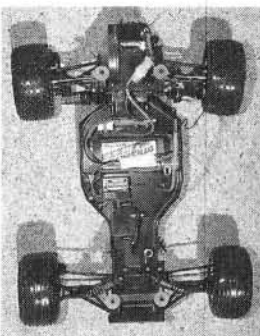
Dislikes

- Some assembly steps might be difficult for novices (especially the installation of the hinged top plate on the chassis).

Associated RC10T2 Sport

This definitely falls at the higher end of the entry-level spectrum and offers first-time racers a solid racing platform to improve their driving skills. It's a slightly toned-down version of the national-championship-winning RC10T2, and it offers every conceivable racing feature a newcomer could ask for: a rugged, anodized-aluminum tub chassis; anodized-aluminum, oil-filled shocks; lightweight, rigid, fiber-composite suspension components; Pro-Line racing tires; and the legendary Stealth transmission with ball diff and slipper clutch. In addition, the suspension is completely adjustable, and this gives first-time racers the opportunity to learn about R/C mechanics. The RC10T2 comes with a stadium truck body, a 23-turn competition stock motor and an incredibly smooth, forward-and-brake, resistor-type, mechanical speed control.

■ Part no. 7012; list price \$305, street price \$159.99.



Likes

- Excellent instructions.
- Rugged aluminum chassis.
- Oilite bushings throughout.
- Stealth tranny with slipper and ball diff.
- Comes with a competition stock motor and an excellent resistor-type mechanical speed control.
- Aluminum shocks.
- Price.

Dislikes

- Battery holder does not accept sport packs very well.

Associated RC10ST

This is based on the most popular off-road vehicle of all time—the RC10. Even though Associated moved on to a new platform for their off-road vehicles, the ST continues to be an extremely competitive racing truck. Features like a tough, aluminum-tub chassis, long-travel aluminum-body shocks, Stealth tranny with ball diff and slipper clutch and a completely adjustable suspension make the ST a tough act to follow. The RC10ST comes with a stadium truck body, a competition stock motor and the forward-and-brake, resistor-type speed control that's included with the T2 Sport.

■ Part no. 7011; list price \$275, street price \$129.99.

(Continued from page 75)

never challenged. In short, I won effortlessly. Mine was the only truck to turn 10 laps in 4 minutes, and this turned out to be my one-way ticket to the A-Main—no doubt, a great start! The RC10T2 Sport smoked trucks that had high-end ESCs, batteries and motors. I was amazed at how well it ran.

Heat 2: it was the Losi Double-Xt's turn. This time, a bad start put me in the flanking position, and that's where I stayed for most of the race. Toward the end, I managed to come

back, and at the sound of the buzzer, I was battling for third. But at the line, another truck got around mine, so I had to settle for fourth and a 9-lap run. The Double-Xt handled excellently and was just as competitive as all the other trucks in my heat.

Heat 3: this time, the Associated RC10ST got a shot. Unfortunately, I had another bad start and ended up in the back of the field again. I just couldn't get it together, and 8 laps later, I rolled in to claim sixth. My poor showing had nothing to do with

Budget Racing Equipment

Even though many of the trucks featured in this shootout come with electronics, you'll soon discover that budget-price equipment is not without shortcomings. Fortunately, the prices of racing-quality electronics have come down considerably, and many R/C manufacturers now offer racing-oriented electronics at budget prices. Four major components make up a racing electronics package: the steering servo, the electronic speed control (ESC), the battery pack and the motor. I'll examine each of these and point out the features to look for.

Steering Servo

Although most radio systems include a servo or two, they generally aren't up to the challenges of vigorous off-road racing. Standard servos are usually too slow, and they never seem to center properly, i.e., they won't return to a neutral position without drifting to the right or to the left, and that makes the truck hard to control.

When you choose a steering servo, look for speed and torque. Pick up one that will rotate from neutral to full lock in 0.16 second or less. Most standard servos take a slow 0.22 second to do this—actually slower than your own reactions. A slow servo will make your truck feel sluggish and unresponsive.

How about torque? A steering servo for a racing truck should have at least 40 oz.-in. to crank the big tires from full lock to full lock. Without a sufficiently powerful servo, your truck's handling will be erratic.

If a servo has at least one ball bearing, it will be more precise than one with a bushing. Consider a bearing a must. How about steel or brass gears? Metal-gear servos operate with less backlash than servos with plastic gears, but the difference is hardly noticeable on the track. Fortunately, Futaba, Airtronics, JR Remote Control and Hitec (to name just a few) offer mid-line racing servos that work better than standard servos but cost far less than pro-level servos.

Electronic Speed Controls (ESCs)

There are three main types: entry-level (or sport), intermediate (or racing) and pro. Most entry-level ESCs work more smoothly and provide more run time than your garden variety mechanical speed control, but they don't have the features that most racers need.

The ESCs offered through Novak, Tekin, LRP and many others differ greatly in features and price. Here's where being a wise shopper pays off. Before you plop down your hard-earned cash for a new ESC, be sure you're getting the most for your money. Here are some racing features to look for in an ESC.

- **High-frequency (HF) switching:** although most ESCs have this feature, some of the ones sold in combo packs with a particular radio system do not. HF controllers can handle more power, run cooler, smoother and longer and lengthen your motor's life. Consider HF switching a must.

- **Torque limiter:** on slippery tracks, this is very useful because it allows you to tone down the motor without having to adjust the gear ratio or change your tires.

- **Heavy-gauge wire:** on most racing ESCs, three, heavy-gauge power wires exit the case (most budget units come with four thinner wires). Heavier wire provides smoother power transfer, is more efficient and can handle higher voltages.

Motors

Little needs to be said about these except that you should keep the ponies under control. All the category 1 and 2 trucks come with stock 540 motors, which are perfect trainers. Stick with these until you can drive without hitting every obstacle along the way.

The category 3 trucks all come with competition stock motors. Generally, these have 27 degrees of timing and 23- to 27-turn armatures. They produce more power than a stock 540 motor, so they might be too powerful for some beginners.

Most of the trucks in this shootout come with some sort of mechanical speed control that was designed to be used only with a stock motor. Even a mild modified motor will burn up these controllers in a hurry. Of course, if you install an ESC, you'll be able to run hot-wind motors.

Batteries

As you probably know, batteries are available in 1400, 1500, 1700 and 2000mAh ratings, and you can buy them in sport packs and in matched packs. Typically, the higher the mAh rating, the higher the price, and matched cells are even more expensive. If you plan to do a little backyard bashing, 1400 and 1500 sport packs will do just fine.

If you plan to race, you might want to spend a few extra bucks and go for cells with a higher capacity. If you can, you might want to pick up an extra pack or two; you'll get more life from your batteries because they won't be used as much, and you'll have less downtime because you won't have to keep recharging that single battery pack.

the ST's performance. I got a bad start and then had nothing but bad breaks. The ST jumped well and felt very responsive, but it just wasn't as dialed as the T2 or the XT.

A-Main: because I'd had most luck with the T2 Sport, I decided to run it in the Main. I qualified in sixth, and this put me in the middle of the A-Main grid—not the best place to start. The buzzer sounded, and we were off. Again, I managed to avoid the turn-one pileup, but three other trucks managed to avoid the carnage, too, and they were soon several lengths in front of me. Through most of the race, I held my ground, but a couple of mistakes cost me a few more positions. At the buzzer, my truck rolled in to finish sixth with a 9-lap run.

I was truly impressed with the performance of the RC10T2 Sport, RC10ST and Double-XT Bushing. I honestly believe that any of these trucks can be raced competitively—at least, I think I just proved that. Even with a mechanical speed control, sport battery pack and bushings, these trucks can get you in the A-Main. Hey, if I can do it, so can you.

IN OUR BACKYARD

One week later, we found ourselves at a BMX track in Bethel, CT. It's intended for BMX-style bicycle racing, so you can imagine the size of the tabletop jumps. The track has a mixture of dirt, mud, sand and gravel, so racing action was dramatic. We marked off a section of track, then bashed and crashed the category 1 and 2 trucks for hours. Each of the four *R/C Car Action* editors had plenty of wheel time with each truck, and this allowed us to reach some general conclusions (see the "Likes & Dislikes" section).

FINAL THOUGHTS

So there you have it. I hope that you enjoyed reading this article as much as we enjoyed "researching" it.

Beginners really have it made now. When I started in R/C more than 12 years ago, the entry-level vehicles left a lot to be desired. Today, entry-level products like the ones featured in this shootout, are high-quality machines that are built to last.

Now that you know the strengths and weaknesses of the trucks tested in this article, you should be able to make an intelligent choice about which one is right for you. It's a good time to get someone involved with this hobby. Show 'em this article!

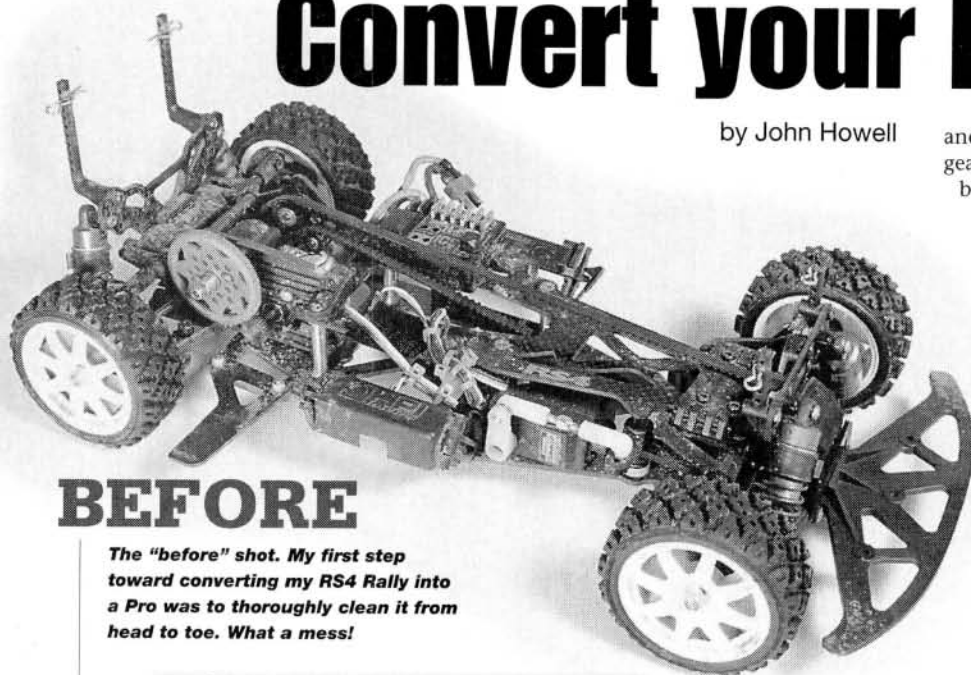
The addresses of the companies featured in this article are listed alphabetically in the Index of Manufacturers on page 201.

Get rid of the gearbox and update your front suspension

REGULAR READERS OF *R/C Car Action* may remember that back in our March '97 issue, I wrote an article on how I converted my HPI* RS4 into a rally car. Some asphalt lovers shuddered when I decided to convert my faithful tourer into a dirt shredder, but I had my reasons. First

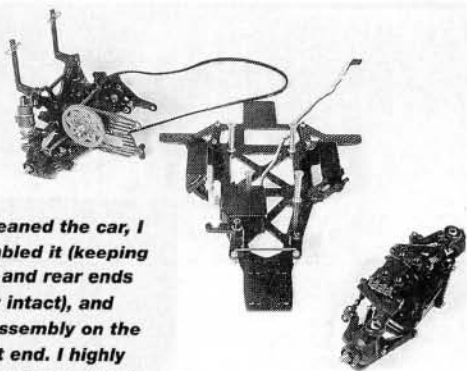
Convert your RS4 to a rally car

by John Howell



BEFORE

The "before" shot. My first step toward converting my RS4 Rally into a Pro was to thoroughly clean it from head to toe. What a mess!

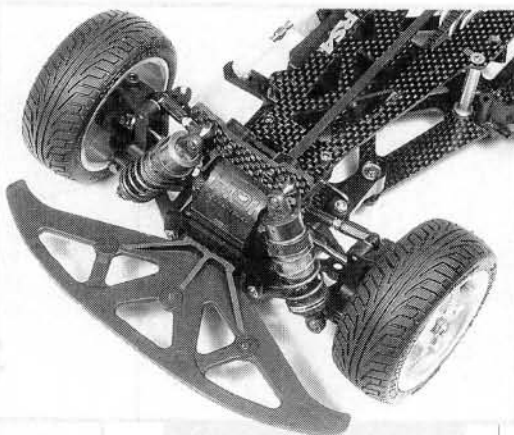


After I cleaned the car, I disassembled it (keeping the front and rear ends relatively intact), and started assembly on the new front end. I highly suggest that you stick to one end of the car and complete it before moving on to the next end so you don't mix up parts or lose track of certain items.

Once I had taken the front end apart, I gathered all the parts I would need from the original front end: ball bearings, the diff, both shocks, the turnbuckle assemblies, two of the four kingpins, the plastic bulkhead/diff housing, the top bulkhead and the lower-arm plate. It wasn't until I looked more closely at the conversion kit's parts tree that I realized that all-new front-end plastic pieces (the diff housing/bulkheads and lower-arm plate) were included with the kit, so I could toss out the old ones and use the new pieces if I so opted.



and foremost, the car's sealed three-gear rear gearbox made the car a perfect candidate for bashing around in the dirt. With all the gears properly protected, I didn't have to worry about destroying my entire drive train the minute the car went off-roading. Second, as more and more "race-oriented" touring cars were being released left and right, my RS4 was beginning to look, well, a little outdated. All in all, though, I was always impressed with the RS4's parking-lot prowess, and although I did have fun running the rally RS4, I must admit I longed for those days when—charged packs



The new pieces went together very quickly. I set up the car in narrow fashion because most of my touring-car bodies are narrow, and the rally car was set up narrow, too. I used a set of HPI's universals (the RS4's original drive shafts will not fit through the conversion kit's uprights, so universals must be used), and I outfitted the car with a set of HPI's new, super sticky, Pro Compound Super Radials.

in hand—I headed to the local lot with my RS4.

When the RS4 Pro debuted not too long ago, I couldn't help but drool over it. After I checked out one of the early samples

RS4 Pro

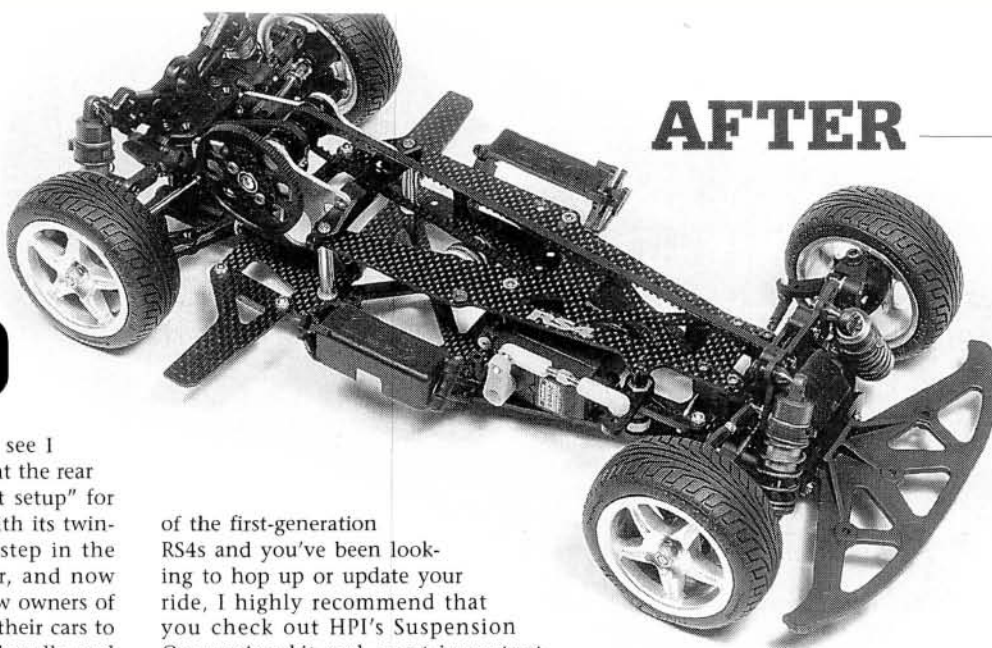
that we received here, I could see I wasn't the only one who thought the rear gearbox wasn't exactly the "hot setup" for the pavement. The new Pro—with its twin-belt drive train—was a major step in the right direction for the RS4 car, and now there are kits available that allow owners of first-generation RS4s to convert their cars to "Pro" level. Want your car to handle and accelerate better? If so, follow along as we take my original RS4 (now in rally mode) and convert it to "Pro" status with help from HPI's Dual Belt Conversion kit and their Pro Suspension kit.

In a relatively short time, you can convert your slightly "long in the tooth" tourer to a top-of-the-line tarmac terror. If you have one

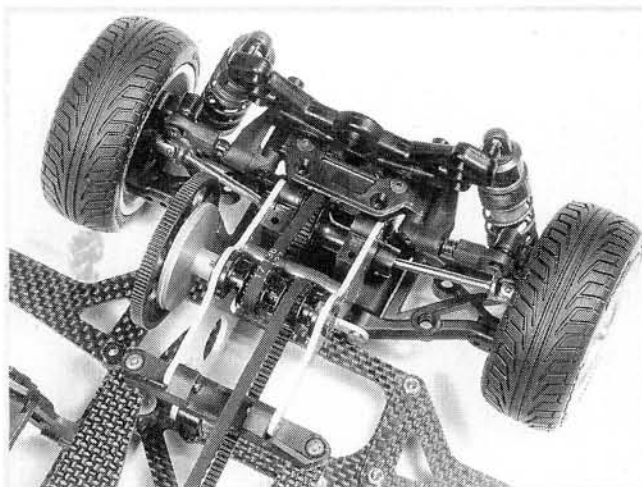
of the first-generation RS4s and you've been looking to hop up or update your ride, I highly recommend that you check out HPI's Suspension Conversion kit and, most important, the company's Dual Belt Conversion kit. Both items easily breathe new life into the car and will help you keep up with the rest of the top-of-the-line tourers out there without having to kick down cash for a new car.

**Addresses are listed alphabetically in the Index of Manufacturers on page 201.*

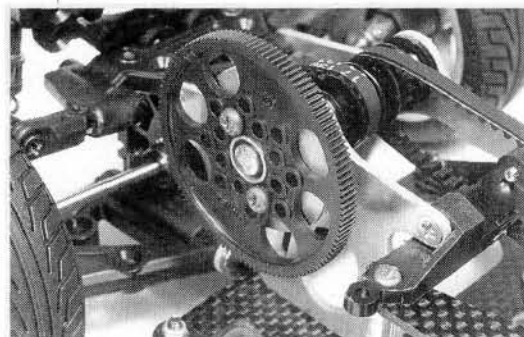
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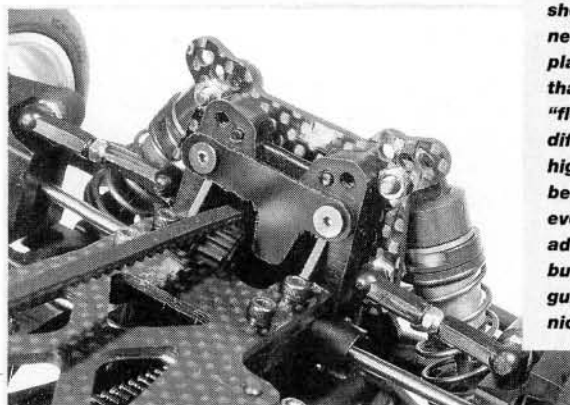
As you can see, my RS4 looks quite different now when compared with how it looked in its rally form. With the new redesigned front suspension and dual-belt conversion, it should have absolutely no problem keeping up with the current top-of-the-line racers out there.



What you see here is the finished product with the Dual-Belt Conversion kit in place. The dual-belt-conversion procedure is definitely more involved than the front-end assembly. The kit's directions are definitely lacking, so it would be a good idea to have the original car kit instruction manual handy. For example, you have to build a new rear diff, similar to the front one, but the conversion kit doesn't include instructions on how to build it, so if you aren't sure how to do it, you'll have to refer back to the original manual. HPI Pro Compound Super Radials were also used on the rear of the car.



While I was working on the back of the car, I replaced the stock RS4 spur gear with this lightweight Trinity graphite composite Zero Friction Super Spur Gear (120-tooth). Yokomo* titanium screws hold it in place, and I replaced the slipper assembly with a screw to lock it down.



On the back of the shock tower, it is now necessary to run this plastic belt guide so that the belt doesn't "float" off the front diff under power. I highly doubt that the belt would fling off even under the most adverse conditions, but having the belt guide in place is a nice precaution.

South Seas showdown

I'VE BEEN around, ya know. I've been to many places and even more races. Kyosho's World Cup finale in the beautiful Philippine Islands got my blood going like in the old days. I've been doing this R/C magazine stuff for about 15 years now, and I suspect that when you do something for that long, you can occasionally feel just a wee bit jaded if you're not careful—the way I'm sure Siskel and Ebert get when sitting through yet another "B" movie. It takes something really special to get me really revved these days, and this race was an A-class event in every respect. I mean, the weather was perfect, the lush tropical surroundings were breathtaking, the gorgeous track was as smooth as glass, the cars looked and even sounded scale (it's those 2-speed trannys), the race organization was fantastic, the hospitable Filipino people were warm and friendly (English is the country's first language!) and then there were the girls! They were beautiful. Who could ask for more? I'm telling you: this was the coolest race I've ever been to.



Story and photos by
Chris Chianelli

KYOSHO WORLD CUP

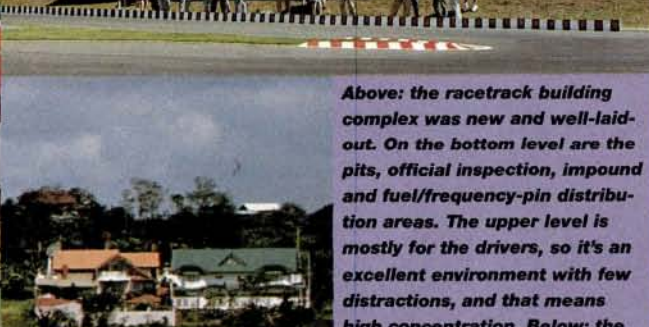




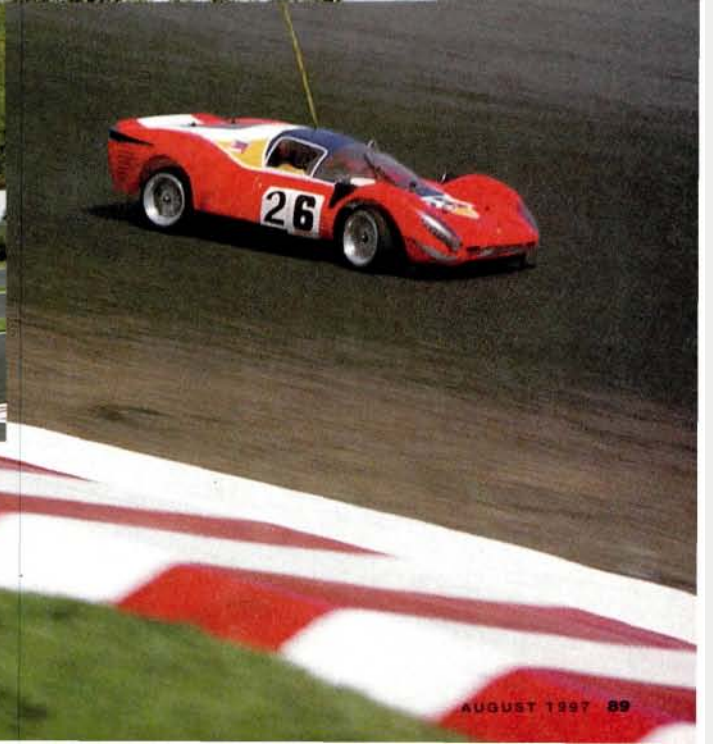
Below: as his father, Mr. Suzuki, looks on (upper right), Kyosho president Aki Suzuki (white shirt, left) gets right into the action. Aki is respected for being a hands-on Sacho-san.



Above: the racetrack building complex was new and well-laid-out. On the bottom level are the pits, official inspection, impound and fuel/frequency-pin distribution areas. The upper level is mostly for the drivers, so it's an excellent environment with few distractions, and that means high concentration. Below: the Filipino pit crews go nuts as their B-Team takes the Gold.



Track marshalling tasks were executed with a friendly smile and a military style of organized precision. Two "platoons" relieved one another, so burn-out never became an issue. You were great. Thanks, guys.



If Magellan had had Maxwell

Friday was a practice, fiddle with your suspension, practice some more, fiddle-with-your-fuel-mixture setup day, so early that morning, Kyosho president Aki Suzuki, his brother Masayuki Suzuki (senior VP of the R/C Division) and I set out across Lake Taal for Taal Island to visit the volcano; yes, it's active. There were three stages to this adventure, and I'm still trying to decide which was scarier—or neater, depending on your point of view.

We first had to go down the mountain from the resort via a dirt road that had been carved into the steep mountainside. This barely one-and-a-half-



lane "road" was constructed by the Japanese during WW II, and every year during the rainy season, it's closed because of landslides. (I almost wished for rain!) We had rented an open jeepney and the dust it threw up was so thick that we had to wrap our heads like Lawrence of Arabia.

After enjoying some *pucit* (squid simmered in its own ink) in the fishing village at the foot of the mountain, braving 5-foot waves, we set out to cross Lake Taal in an indigenous bamboo outrigger; we got very wet! As we approached Taal Island, I felt like Mr. Christian landing on Pitcairn Island (no, Aki-san was not Captain Bligh). This island seemed frozen in time—just what you'd expect to find in the Pacific in the



18th century: grass huts, coconuts and naked kids everywhere.

The next episode of "Cliffhanger Chris" was the horseback ride up to the volcano. At times, the



trail was no more than 18 inches wide—and rocky! I tried, in vain, not to look down the sheer drop. I owe my life to Maxwell, the surefooted little horse that got me there and back—alive! His picture will be given its rightful place right next to Luna's.

Why do I do these things? I do them to bring you, my faithful readers, a riveting story that will keep you up nights. NO! I'm sorry, I lied! I do it because ... I might never again get the chance. So I say a prayer, and just do it! That's why!! And I just had to tell you all about the fun I had.



The A-Main Le Mans-style start. Any driver who tested with a 0.010 percent-nitro blood le

THE ARRIVAL

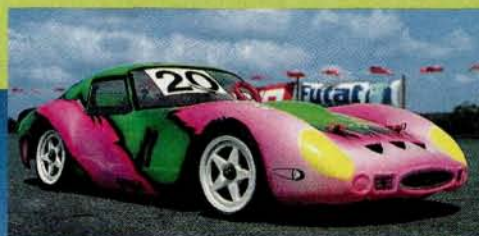
After our long flights from just about everywhere in the world, we all met in the Pavilion Hotel for a restful pit stop in Manila, the capital of the Philippines. It was Taal Vista, however—a country resort named after the volcanic lake it overlooks in Tagatay, about 2.5 hours south of Manila—that was the final destination of all the race teams. That first night we all got together—teams from 18 countries—for some chicken and pork *adobo* (a Filipino dish I love) and some native island dance entertainment. For a year, these drivers had competed in their homelands, and now this was it—the climax in a faraway land. Suddenly, it struck me: this wouldn't be like any other race I'd ever been to.

THANKS, JACK!

The exquisite, brand new and very big track was a three-minute ride down the

street from our resort. The main two-story building was well-laid-out and overlooked the course. This building held the pit tables, impound and frequency-control area and official post and inspection area. The sheltered drivers' stand was on the much quieter second floor where drivers could really get into that competitive, focused state of mind. It also provided an excellent vantage point for a full view of the track layout. And what a track it is!—a twisting roadcourse with a 300-foot backstretch and highly visible red-and-white curb barriers around every turn. Its surface was so smooth that I never detected any of the cars losing their cool because of surface imperfections—and believe me, I was looking carefully for signs of "bouncy" behavior; there simply was none. The grass around the track was so well-groomed that I wished I had my MacGregor putting iron with me! We have Jack Enrile—a very well-

COOL Factor



Left: the Concours line-up. Bottom: this MGB from the Japanese Team took top honors. Top: here's my concours pick—a Ferrari 250 GTO in tropical colors. It seemed to fit this event best, and it hailed from Hong Kong.



Obviously, major contributors to the cool factor were the Kyosho Nostalgic Series cars. These 4WD gas machines not only hooked up well (after a few hours of practice and tuning, of course) and were reliable (I remember only two flame-outs all week-end), but they also sported exotic bodies like the Ford GT-40, Daytona Cobra, Lotus Europa, Corvette Stingray, Ferrari 330 P4 and my favorite, the Ferrari 250 GTO. Their aerodynamic designs and aesthetic appeal fall in a category that's somewhere between Flash Gordon's star cruiser and a Cylon fighter.



more was immediately disqualified and cuffed.

known Filipino land developer and entrepreneur—to thank for this perfect facility. Thanks, Jack!

By 12:30, most of the teams were starting to get their cars really dialed in. I whipped out the Nikon, threw myself

down onto that closely cropped grass, aimed ... and shot nothing. Instead, I was completely mesmerized by awesome scale machines drifting through turns, upshifting in the straights, downshifting for turns and braking hard for



WORLD CUP RULES

■ **Cars.** Each team can register two cars, one of which can serve as a second, "back-up" car. During the race, the second car can be used if its body is the same as that of the first and if it runs on the same frequency.

■ **Allowed parts options.** Only Kyosho parts are allowed.

■ **Airflow openings and accessories.** Engine-cooling openings may not be bigger than those shown in authorized rule-book drawings. Engine access openings and scale openings are obligatory. A spoiler that's part of a kit is allowed, e.g., a Toyota Supra spoiler can be used only for a Toyota Supra body.

■ **Engines.** Only the GS11X is allowed. Technical inspection will check that its specs are stock. All internal and external do-it-yourself modifications, including those to the carburetor and exhaust system, are strictly forbidden.

■ **Recoil starter.** The stock recoil pull-starter is required, and it must be functional.

■ **Fuel.** Provided by the organization; no other fuels are allowed.

■ **Chassis.** All dimensions must be those of the original production kit. Modifications will be cause for disqualification.

■ **Driver changes.** During the qualifying heats, driver choice is optional. In the final, after 15 minutes, a change of driver will be announced. Teams have a specified time in which to make this change. Non-compliance means immediate disqualification.

■ **Mechanics.** During the race, teams may each have up to two mechanics.

■ **Decoration.** Decorative detailing is welcomed. Sponsor stickers are allowed if the sponsor is recognized by the racing organization.

History rolls on ... bright wheels



The colorful jeepney is an automotive creation that's totally exclusive to the Philippines, and its origin is interesting. When the U.S. pulled out of the Philippines after the end of WW II, the military left behind untold numbers of Willies Jeeps.

Recovering from the ravages of war, the Filipino people resourcefully turned the stubby little Jeeps into far more efficient people carriers. They literally cut the vehicles in half, welded in a center section and installed benches and a roof.



Today, however, the jeepneys are built on light diesel- and gas-truck frames made by companies such as Toyota and Isuzu, and they often sport polished, stainless-steel bodywork. But decades of jeepney evolution notwithstanding, whether they date from the 1950s or the 1990s, these magical little buses have never failed to fascinate tourists. The tradition is a constant—truly a rolling icon of a vibrant country.

To me, these wonderfully ornate contraptions are a national symbol of a resilient people working hard to better their country. The jeepney is now beginning to be exported. Considering the tremendous economic potential the Philippines has always possessed, let's hope this marks the start of a trend towards successful international trade for a country and a people whose time has finally come.



One night some of us went to a restaurant. Aki says, "I'll rent us a jeepney!" Of all the tens of thousands of jeepneys in the Philippines, he hires this one. A jeepney-jalopy. Hey Aki, I'll bet MacArthur rode in this one!

KYOSHO WORLD CUP



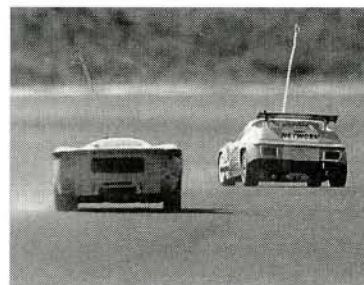
winners

FINAL A 60 minutes

Pos.	Laps	Time	Team	Drivers
1	77	1:00'37.34	Philippines B	Joel Figue, Ralph Lorenzo
2	76	1:00'07.54	Japan A	Kiyomi Suzuki, Yukihiya Satou
3	75	58'58.73	Japan B	Tutomu Arakawa, Tetuya Miyoshi
4	74	59'24.83	Philippines A	Paul De Jesus, Roland Hermoso
5	73	1:00'17.98	Switzerland B	Markus Bader, Daniel James
6	73	1:00'29.74	France B	Sacha Crespy, Frederic Esnault
7	70	1:00'11.32	Japan C	Sigeo Nomura, Akimi Tooyama
8	70	1:00'30.11	Sweden B	Michael Larsson, Thomas Stromberg
9	49	55'45.77	Germany	Frank Lubbing, Thomas Kroger
10	19	1:00'38.28	Finland	Pekka Keinenen, Sami Kaariainen

the hairpins—all while leaving those curling blue exhaust trails.

The best part was how evenly matched the cars were (owing to the strictly enforced rules). I knew what the next day had in store for me: close competition on a tight field; multi-car battles for position; and scale machines doing the "leaning dive" for the best line. At the end of practice day, in all the turns, we could see a dark path where so many cars had taken the same line around them. These "blue grooves" showed we were in for some serious action.



• **Qualifying.** Saturday started with pre-qualifying in which every team ran in two, 10-minute "time-attack" heats for starting positions. The qualifiers were a series of three, 20-minute "time-attack" heats. Teams who placed from first through 10th advanced to the A-main; 11th through 20th moved on to the B-Main; and all the other teams entered the C-Main—a very interesting system. Depending on how a driver's heats went and the scoring worked out, he could be bumped up even if his wasn't the fastest car. With this system, I've seen teams get bumped up several times, right into the A-Main. It's kind of like a wild card in pro ball.

(Continued on page 95)

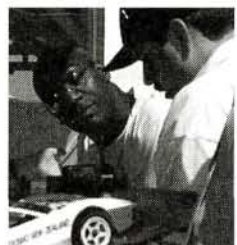
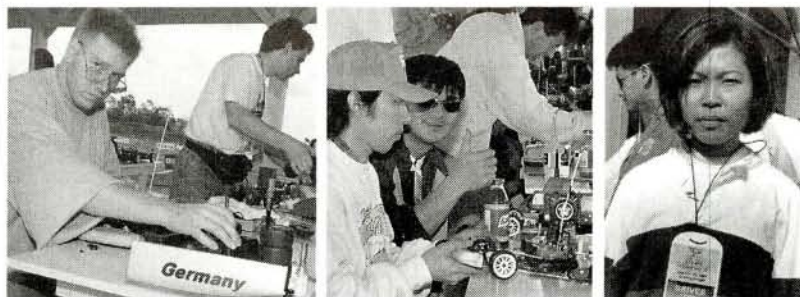
WE'VE PUT THE STAI



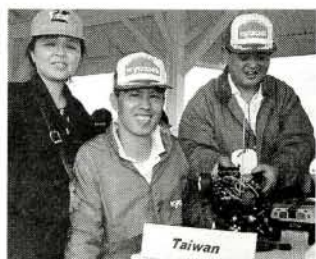
When you're ready to fire up your on-road gas racer, fire up your computer first. Log onto the Team Serpent Network web site and check out our ever-expanding gas track directory, complete U.S. and world-wide racing calendars, track photos, contact numbers, maps and much more – total info for all the on-road nitro action in your area and beyond. Start your modem. Then, gentleman, start your engine.



E-mail: Serpent USA, Inc.: serp-usa@ix.netcom.com Serpent b.v., The Netherlands: team@serpent.nl



Some of the teams' members, counterclockwise from upper right: driver Lim Cheow Wee Andrey from Singapore, Kiyomi Suzuki (no relation; "Suzuki" is as common in Japan as Smith is here in the States) and Yukihiisa Satou from Japan, Frank Lubbing from Germany, our very own Moyes Lucas Jr. ("the professor") from L.A., CA (yeah!), Ka Yioh Kwong and Tza Shiung Hung from Hong Kong, Lan Hsias-Sung and Hsieh Hung-Lung from Taiwan and Teresa Ejarqua and Manuel Muniesa of Spain.



Upper level drivers' stand location was the best for concentration and visibility.



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EXCITEMENT IN THE FAST LANE

AUGUST 1997 93

KYOSHO WORLD CUP

(Continued from page 92)

I could see that some of the teams really had their machines outstandingly dialed. In particular, the Filipino, Japanese and Swiss teams put on an intimidating show, but it was still anybody's race (again due in large part to the rules, which specify the equipment that's allowed—everything from the 1.8cc engine to the tires).

• **Mains.** From the start of the first C-Main, it was wonderfully apparent that Sunday would deliver the most excitement yet. The full field of scale cars coming off the line for the first time and then snaking through the first few turns was something right out of Le Mans or Sebring. This time, I couldn't allow myself to go catatonic watching this "scaled-out" action; I had to get some good shots, or I'd never hear the end of it from resident wise-ass "Doogie" Howell—the guy who taught me how to take a decent action shot. Believe me, I put the motor drive on high speed for this, the main event!

With driver changes, pit stops and many changes in the lead, the 30-minute C-Main and the 45-minute B-Main were anything but waiting periods for the A-Main (unlike some of the other events I've attended; there goes that even-competition factor creeping in again). In both Mains, we saw a tight field for the first few laps and then a gradual division into battles for first, second and third places.

• **A-Main.** During these 60 minutes, the competition reached a feverish pitch. In fact, the race started even before the buzzer with the mechanics making a Le Mans-style 50-yard dash from across the track—a bit of comic relief. (I'll let the photos tell this story.) Running, stumbling and even falling, the mechanics reached their cars, fired them up, and the race was on! This time, the field stayed tighter for much longer, but it eventually did develop into a protracted battle between the Philippines B team and the Japanese A team for first, and the Philippines A team and the Japanese B team for second. The Philippines A team had a great shot at first, but late in the race, a mishap lost them half a lap, and there wasn't enough time left to make it up. The Swiss B team and the French B team vied for third.

With the end in sight, the Philippines B and Japanese A teams swapped the lead several times. A very large Filipino crowd cheered the home team all the way. When the checkered flag fell, it was the Philippines B team, and the crowd went stark, raving mad (they're a very festive people, and as an Italian, I felt right at home with them; they have such a zest for having fun). I'm not exaggerating, guys; they sent sky rockets soaring over the track from the elevated spectator area (this track is *so* well-thought-out, Jack).

I WANNA GO BACK!!

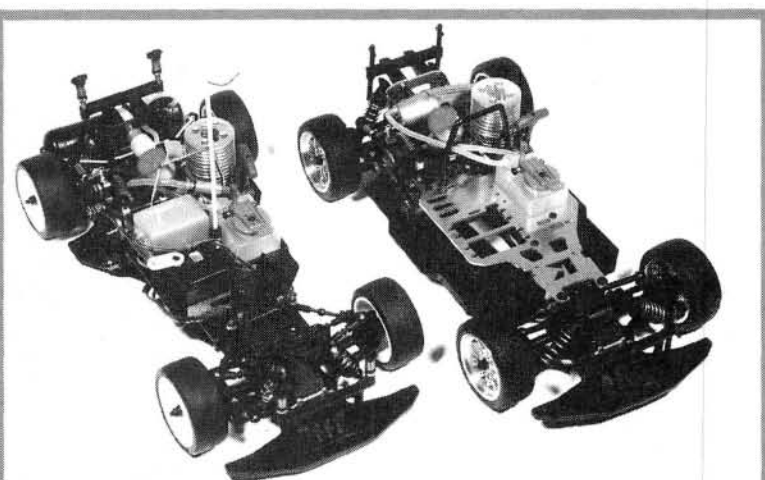
What else can I say? I want to go to the next Kyosho World Cup, Aki! I would like to also state an opinion: this race was outstandingly successful because of the rules and limitations. Out of these were born the fun, the close competition and the spectator excitement; and complaints were almost nonexistent. You see, there was nothing to complain about. This was anything *but* a race of the wallets; this was a race of driver skills like few I've ever seen. And it was sooooo obvious who the victorious drivers were: they were the "practicers," "relaxers" and "focusers."

Events like this, we need more of. ■



If you're ever in Manila, you have to stop at Lil's Hobbies in the beautiful Makati section of the town. Above right: on the rooftop, there's an on-road course that buzzes daily with nitro-burning road machines and very friendly Filipino racers. Above left: Lil and her charming staff in the front of the store. Left: Lily and Shakespeare Chan treated me like a visiting king

(thanks for making me feel right at home, you guys). Below left: brothers of Kyosho; Aki-san (right) and Masa-san Suzuki and last, but far from least, is Jaka Group Corp. president Jack Enrile, whose generosity and hospitality played a huge part in making my stay so much fun and this race so successful. Thanks again, Jack.



Kyosho GP-10—as wild as you want

The rules for the Kyosho World Cup are pretty strict: you can use only Kyosho's GP-10 Spider chassis, and the only hop-ups must come from Kyosho. Fortunately, these are anything but limitations, as Kyosho offers enough accessories to turn the GP-10 from mild (right) to wild (left).

Kyosho's list of GP-10 options ranges from the absolutely necessary (ball bearings and oil-filled shocks) to stuff that would please even the most dyed-in-the-wool hop-up junkie (graphite upper chassis, special roll bars, 2-speed transmission).

Regardless of how wild you make the GP-10, the World Cup will still provide an even playing field because no one is allowed to fudge with the GS11X engine at all. Even the factory pull-starter must remain intact. I don't know which looks more awesome—the fully optioned GP-10 chassis or the GP-10 chassis covered with one of Kyosho's Nostalgic Series bodies! Watch for a feature article on the full-option GP-10/Nostalgic Series car that competed at this race, in the next issue of *RCRA*.

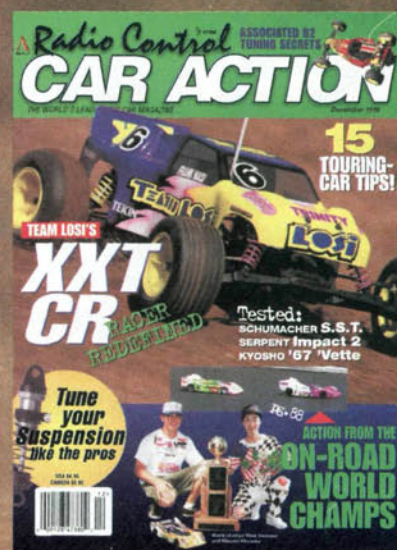


Team

by John Howell

WHEN IT'S time to choose the *Car Action* Truck of the Year, we editors discuss—at length—each and every eligible entry. This year, when we sat down to discuss the candidates, we quickly and unanimously voted on one vehicle—Team Losi's Double-XT 'CR.' Why? Because Team Losi took the already successful Double-XT and, with subtle refinements, managed to take it to a whole new level, performance-wise. That's why.

Did they *need* to make this truck? No, not really. Were Losi fans asking them daily for such a truck? Nope. As a matter of fact, the Double-XT was still a force to be reckoned with on the track, so why did they change things? Because Team Losi thought we racers deserved their absolute best. So without further delay, here's *Car Action's* 1997 Truck of the Year.



Radio Control CAR ACTION 97 TRUCK OF THE Year



Losi's Double-XT 'CR' Takes Top Honors

A STRONG RACING HERITAGE

Team Losi produced the first actual production racing stadium truck—the JR-XT. The JR-XT (July '90 issue) was initially brought to the drawing board by Losi's top driver, Jack Johnson. He and Gil Losi Jr. worked on



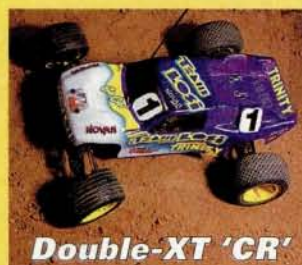
a prototype of the JR-XT and then released the production version. And the world of racing trucks has never been the same; a new standard had been set. In '91, the JR-XT took top honors as our first ever Truck of the Year (April issue).

With time, the popularity of racing trucks grew, and in September '92, Team Losi released the hot LX-T; its performance was soon recognized as a new benchmark. This all-new design relied heavily on Losi's then groundbreaking Stiffezell plastic composite. Coming at a time when graphite plates and aluminum tubs were considered king, this was obviously a bold move. We were so blown away by the truck's performance that it



was easy to select it as our 1993 Truck of the Year (August issue). In '94, after the IFMAR Off-Road Worlds in England, at which Losi introduced the Double-X 2WD buggy, everyone waited to see whether they would create a truck using the same modular technology. In January '95, when the eagerly anticipated Double-XT truck *did* arrive on the scene, many considered it to be one of the best, if not *the* best of Losi's offerings. The Double-XT had what it took to be numero uno—our '95 Truck of the Year (July issue).

With the release of the Double-XT 'CR' kit (December '96 issue), Losi again upped the ante in the racing truck category. So the Double-XT 'CR' is the latest in a long line of successful Losi trucks; no wonder it's our Truck of the Year.

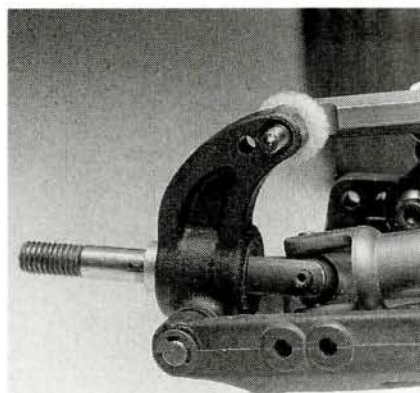


TRUCK OF THE YEAR

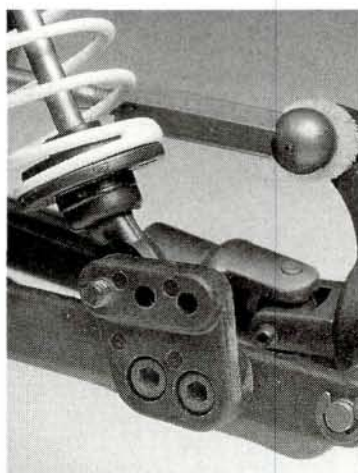
Radio Control
CAR ACTION
97 TRUCK
OF THE
Year



The XL chassis is 0.300 inch longer than the original Double-XT chassis; it handles the bumpy sections better and also improves steering at high speeds and when on power.



The new zero-degree rear hubs offer just two camber-rod mounting holes (the old hubs offered five positions). This simplifies tuning.



SPECIFICATIONS

SCALE 1/10
LIST PRICE \$359.95

DIMENSIONS

Length overall 15.875 in.
Wheelbase 11.4 in.
Width (F/R) 12.5 in./12.6 in.

WEIGHT (gross, RTR w/7-cell battery) 4 lb., 3.1 oz.

CHASSIS

Type Three-piece modular
Material Stiffezell

DRIVE TRAIN

Type 3-gear, sealed tranny (2.61:1 ratio)
Primary Pinion/spur
Transmission Universal-joint shafts
Differential(s) Ball
Slipper clutch Friction w/Hydra Drive
Bearings/bushings Sealed ball bearings

SUSPENSION (F/R)

Type Independent A-arm w/adj. camber link
Damping Oil-filled, coil-over shocks

WHEELS (F/R)

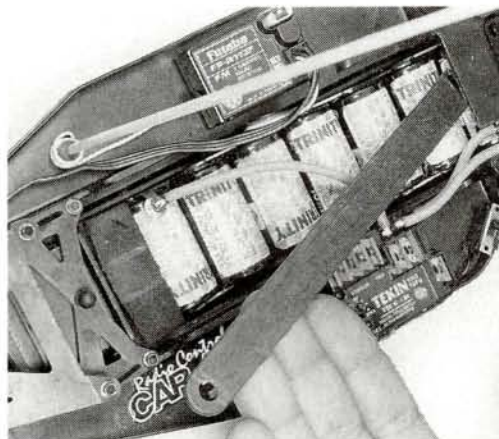
Type: One-piece plastic
Dimensions (DxW) 2.2x2 in.

TIRES

Front Silver-compound directional rib
Rear Silver-compound IFMAR pin

ELECTRICS

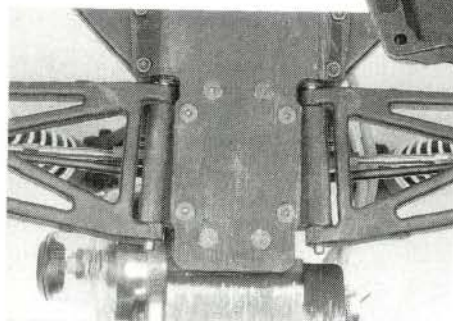
Motor, battery, ESC Not included



To help facilitate between-heat battery changes, a simple molded battery strap replaces the old hook-and-loop straps. The molded strap also holds the cells more securely.

New rear-suspension geometry has the shocks mounted farther out on the suspension arm. This increases the shock's "pack," and that improves the truck's lateral stability and allows the use of lighter oil and softer spring combos.

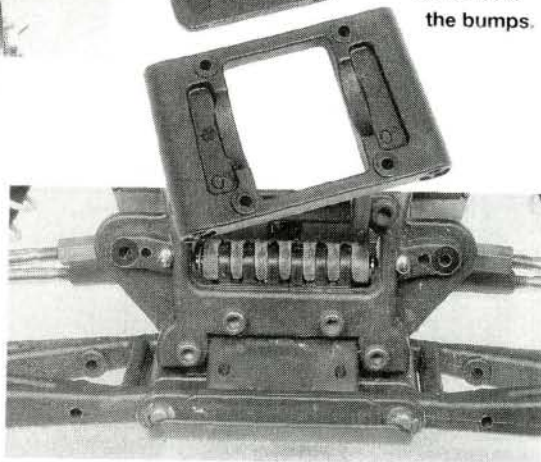
TRUCK OF THE YEAR



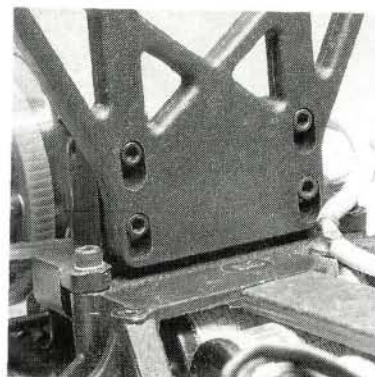
A new, two-piece rear-suspension plate and a wider rear pivot support/arm mount replace the older truck's one-piece plate. The new design places the rear toe-in inboard instead of at the hubs where it was previously. The new setup provides more off-power steering, and it allows the truck to accelerate faster—especially coming out of turns. This means you'll be able to roll on the throttle much sooner after exiting turns.



This pivot block is Losi's optional 0-degree unit (below); it's better on blue-groove conditions where there's a lot of bite. It has less anti-squat, so the truck accelerates better over the bumps.



New front suspension arms have holes that can accommodate an optional front swaybar.



The rear shock tower has two more holes that allow you to lower it, and that increases rear suspension travel.

In creating the Double-Xt 'CR,' Losi has improved on an already successful, race-winning design. It's truly a state-of-the-art race truck—in design and durability—and there's no doubt in our minds that the Double-Xt 'CR' deserves to be the *Car Action* 1997 Truck of the Year. ■

TURBOTHIRTY

Check these hi-performance features

- **Complete battery charge with reapeaks** gives consistent, reliable charging every time without false peaks. Set initial charge amps and reapeak amps at different values. Set the peak detect drop back voltage for amount of battery pack warm-up.
- **Turbo flex your batteries** to lower cell impedance. Reconditions new vitality into older cells.
- **Cycle or discharge your packs at up to 30 amps** For 1, 4 and 6 cell packs. Up to 25 amps for 7 cells. This feature also eliminates discharge resistors and bulbs. It is great for indicating how much run time was left in your pack.
- **Save set in values** in power down memory so you don't have to punch them in the next time you power up.
- **Internal cell resistance** is given for packs and single cells. An optional hi-amp single cell battery box is offered for easy cell matching.
- **Save carrying space and clutter** by eliminating a voltmeter, charge discharger, motor run battery pack and a fan.
- **Run your comm lathe or break in brushes** by using the motor run feature. Eliminates the need for a separate supply.
- **Discharge time matches purchased batteries.** Since competition electronics makes the industry standard TURBOMATCHER, you can be guaranteed that the readings you get from the TURBOTHIRTY will match the label readings on your purchased cells.

TURBOTHIRTY

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Competition Electronics

TURBO FLEX

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Story & photos
by FRANK MASI

Radio Control CAR ACTION



The Reedy "Firehawk" bird that adorned the roof of Team Associated's Scott Hughes' truck was artfully constructed using tire foam, CA and Magic Marker pens. Hughes and the 'hawk' ran well during the A-Main, but parted ways after an unfortunate encounter with another vehicle.

World Champion Matt Francis (center) chose the Cactus to make his debut as a Team Losi driver. Matt won two of the three classes he entered, including the XX-4 ... er ... I mean the 4WD class. Flanking Matt are Losi teammates Gabe Boudreau (third place) and Brian Kinwald (second).



T'S 7:30
Wednesday
morning, and as I pull into the parking lot of Scottsdale R/C Speedway (SRS) in

Tempe, AZ, it's apparent that the Annual Pro-Line Cactus Classic can no longer be considered just a "fun" race. Although the race doesn't officially begin until Friday, motor homes and



pit tents already dot the landscape, and even at this early hour, the large, covered drivers' stand is occupied two rows deep. All the big teams are here, sharing the track with the best racers from Arizona—from all over the country, actually. The Cactus is now well-known, and it draws competitors from as far away as Florida.

Attack of the 10-Year-Olds

One of the weekend's closest races occurred in the Stock Truck A-Main. At the sound of the horn, three trucks broke from the pack and fought it out for the entire 4 minutes, trading paint and positions, sometimes several times per lap. Although Justin Morrison crossed the line first, I thought that all three racers deserved congratulations for putting on such a show of speed and restraint. Imagine my surprise when I learned that second- and third-place finishers Brad Rogney and Ryan Maifield had just turned 10!



Brad and Ryan are regulars at SRS, and although fierce rivals on the track, the two have become good friends. If these two are representative of the next generation of R/C racers, look out, Brian and Masami, here come the 10-year-olds!

PRO-LINE CACTUS CLASSIC



After four years of covering the Cactus, I can state this unequivocally: the race gets better every year. Last year, we saw the addition of a drivers'-stand canopy that eliminated the problem of poor visibility because of glare. This year, the SRS crew expanded the off-road track, taking over space previously occupied by a seldom-used dirt oval.

WinnersWinnersWinners

2WD Novice

Fin.	Driver
1	Gary Gervais
2	Dylan Baine Hinkle
3	Russ Lewis
4	Greg Vinas
5	J.R. Delangel
6	Jason Eubank
7	Ian Fay
8	Melvin Ramos
9	Adam Womboldt
10	Shawn Shirashi

Truck Novice

Fin.	Driver
1	Jimmy Red
2	James Dirks
3	Jason Amiot
4	Gary Gervais
5	Joe Turcotte
6	Dave Mackie
7	Jonathan Ayers
8	Dylan Baine Hinkle
9	Brian Causse
10	Seth Zorensky

2WD Stock

Fin.	Qual.	Driver	Chassis	Motor	Battery	ESC	Radio	Body	Tires(F/R)	Pinion/Spur
1	3	Matt Francis	Losi	Peak	Orion	LRP	Airtronics	Losi	Losi	23/84
2	4	Jerry Walter	Losi	Race Prep	Pro Match	LRP	Airtronics	Losi	Losi	26/84
3	1	Brent Thielke	Losi	Race Prep	Orion	Novak	Airtronics	Losi	Losi	26/86
4	8	Jimmy Babcock	Losi	Maxtec	Maxtec	Tekin	Airtronics	Losi	Losi	23/84
5	2	Jeremy Kortz	Associated	NA	Ballistic	NA	NA	NA	NA	NA
6	9	Brad Rogney	Losi	Maxtec	Maxtec	Tekin	NA	NA	NA	NA
7	6	Justin Morrison	Losi	Maxtec	Pro Match	Tekin	Airtronics	Losi	Losi	23/84
8	7	Chris Koetsch	Associated	Quarterflash	Trinity	LRP	Airtronics	Associated	Losi	22/81
9	10	Matt Lauerman	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi	22/84
10	5	Philip Atondo	Losi	Peak	Orion	Novak	Airtronics	Losi	Losi	22/84

2WD Modified

1	2	Gabe Boudreau	Losi	Peak	Orion	Novak	Airtronics	Losi	Losi	21/86
2	5	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi	19/84
3	1	Matt Francis	Losi	Peak	Orion	LRP	Airtronics	Losi	Losi	22/84
4	6	Mark Pavidis	Associated	Reedy	Reedy	LRP	Airtronics	Associated	Pro-Line	19/86
5	4	Jim Gard	Losi	Race Prep	Pro Match	Novak	Airtronics	Losi	Losi	22/86
6	3	Alex Guerrero	Losi	Maxtec	Maxtec	Novak	Airtronics	Losi	Losi	NA
7	7	Greg Hodapp	NA	NA	NA	NA	NA	NA	NA	NA
8	8	Brian Thielke	Losi	Race Prep	Orion	Novak	Airtronics	Losi	Losi	22/86
9	9	Jeremy Kortz	Associated	NA	Ballistic	NA	NA	NA	NA	NA
10	10	Rick Hohwart	Losi	Peak	Orion	Novak	Futaba	Losi	Losi	NA

Stock Truck

1	1	Justin Morrison	Losi	Maxtec	Pro Match	Tekin	Airtronics	Losi	Losi	21/87
2	4	Brad Rogney	Losi	Maxtec	Maxtec	Tekin	NA	NA	NA	NA
3	2	Ryan Maifield	Losi	Peak	Orion	Tekin	Futaba	Protoform	Pro-Line	21/88
4	5	Brandon Aymar	Losi	Peak	Orion	Novak	Airtronics	Losi	Losi	21/88
5	10	Joe Guerzon	Losi	Maxtec	Maxtec	Novak	Airtronics	Losi	Losi	22/88
6	8	Brian Bosley	Associated	NA	Maxtec	Cyclone	Airtronics	Associated	Losi/Pro-Line	21/87
7	6	Chuck Erickson	Losi	Extreme	Rossi's	Tekin	Airtronics	Losi	Losi	22/88
8	7	Jon Roberts	Losi	Nightmare	Pro Match	Tekin	Airtronics	Losi	Losi	NA
9	3	Billy Caley	NA	NA	NA	NA	NA	NA	NA	NA
10	9	Bryan Windberry	Associated	Reedy	Reedy	LRP	Airtronics	Associated	Pro-Line	21/84

Modified Truck

1	1	Jim Gard	Losi	Race Prep	Pro Match	LRP	Airtronics	Losi	Losi	18/84
2	2	Gabe Boudreau	Losi	Peak	Orion	Novak	Airtronics	Losi	Losi	19/88
3	5	Mark Pavidis	Associated	Reedy	Reedy	LRP	Airtronics	Associated	Pro-Line	19/87
4	6	Jimmy Babcock	Losi	Maxtec	Maxtec	Tekin	Airtronics	Losi	Losi	19/87
5	4	Scott Hughes	Associated	Reedy	Reedy	LRP	Futaba	Associated	Pro-Line	18/87
6	10	Brent White	Associated	Trinity	Trinity	LRP	Airtronics	Associated	Pro-Line	18/87
7	9	Jade Kurtchi	Losi	Peak	World Class	Novak	NA	Losi	Losi	20/87
8	3	Alex Guerrero	Losi	Maxtec	Maxtec	Novak	Airtronics	Losi	Losi	18/88
9	7	Todd Cariseo	Associated	Reedy	Reedy	Novak	Airtronics	Associated	Pro-Line	18/87
10	8	Jerry Walter	Losi	Race Prep	Pro Match	LRP	Airtronics	Losi	Losi	19/88

4WD Modified

1	2	Matt Francis	Losi	Peak	Orion	LRP	Airtronics	Losi	Losi	18/84
2	3	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi	19/84
3	6	Gabe Boudreau	Losi	Peak	Orion	Novak	Airtronics	Losi	Losi/Pro-Line	20/86
4	1	Greg Hodapp	NA	NA	NA	NA	NA	NA	NA	NA
5	4	Rick Hohwart	Losi	Peak	Orion	Novak	Futaba	Losi	Losi	NA
6	8	Albert Guardado	NA	NA	NA	NA	NA	NA	NA	NA
7	7	Richard Trujillo	Losi	Peak	Orion	Orion	Airtronics	Losi	Losi	20/84
8	5	Alex Guerrero	Losi	11x3	Maxtec	Novak	Airtronics	Losi	Losi	19/84
9	10	Brandon Rowland	Yokomo	Reedy	Reedy	LRP	Airtronics	Yokomo	Pro-Line	16/87
10	9	Ryan Maifield	Lazer	Peak	Orion	Tekin	Futaba	NA	Pro-Line	19/96

PRO-LINE CACTUS CLASSIC



Peak Performance owner Rick Hohwart wrenches on his Team Losi Double-X buggy. There's always a large Peak contingent at the Cactus Classic.



Losi team manager Richard Trujillo gets snagged dipping into the Team Losi "candy van" for some hot tires. Richard spent most of the race doling out the goods to eager Losi team racers.

The track—comprised of a hard-packed dirt that develops a "blue groove"—was generally well-received by the racers. Although relatively smooth, there were several small "riser" jumps as well as one large tabletop in front of the drivers' stand. This jump ended in a "pit," and most drivers soon learned how to land on the downside of the tabletop and accelerate through the pit for the quickest time.

The three-day event included

two qualifying rounds on Friday and Saturday and the Mains on Sunday. The Arizona weather was perfect, and all 42 qualifying heats went off without a hitch.

If you're looking to attend a big race, add the Cactus Classic to your calendar. It boasts perfect weather and a challenging track and, who knows, maybe you'll even have Brian Kinwald or Matt Francis in your qualifying heat—truly an event on the move!

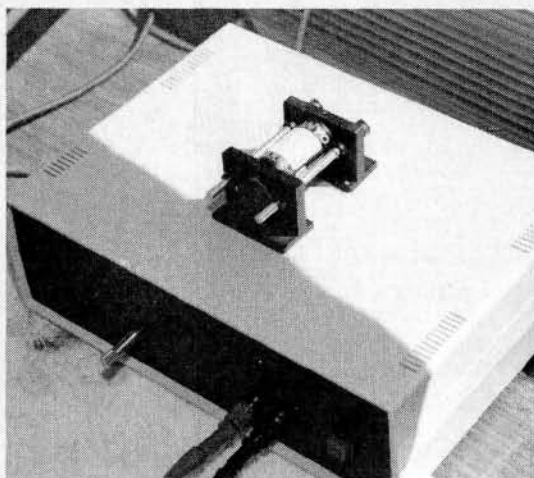
New in the Pits



■ Left: Mike Dunn of Race Prep* showed me his new brush-cutting device—the Clyde Brush Grinder. The Grinder differs from other brush cutters in that it can accept grinding bits of various diameters (in increments of 0.005 inch) to match the diameter of the brush's contact area to that of the comm. As you know, when you have your motor's comm trued, its diameter becomes smaller. Now, to minimize break-in time, you can match your new brushes to your comm instantly.

■ Right: you're looking at a prototype of the Battery Blaster—a device made by Pro-Match Batteries* that runs a powerful charge of electricity through an individual cell to increase its voltage by lowering its internal resistance.

According to Jeff Roe of Pro-Match, the Blaster puts more electricity through a cell than is used during heart defibrillation, so expect to use a special safety cover that will prevent accidental contact during operation.





Team Graphite

As always, the Concours competition was tough to judge. There were many creative and well-executed projects, but I noticed what I thought was a new trend in paint schemes: several vehicles sported a cool "graphite" look.

As it turned out, this "trend" belonged to a family of R/C enthusiasts: the Valles of Long Beach, CA. Tom Valles (who won the third-place award in Concours) said that after he came up with an original graphite-look paint job, his family put him on the spot for similar bodies for their cars.

Motor Guy

I couldn't help noticing a steady procession of racers—motors in hand—walking to and from the far end of the pit area. I stopped one of them to ask him where he was going, and he told me that there was a guy with a "bitchin'" dyno who was tuning motors for free.

"Free?" I asked.

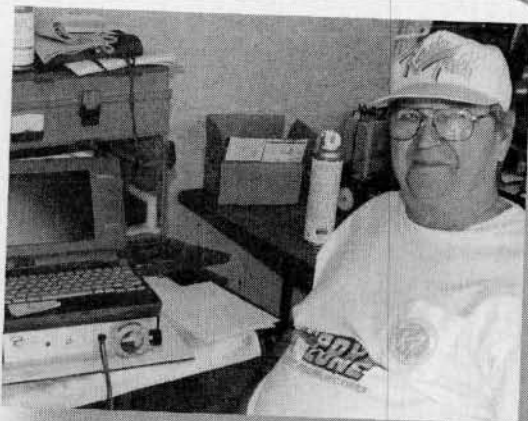
"Yup, free," the racer replied. "He even gave me a new set of brushes."

Meet Clyde Bayer, 71, from Tulsa, OK. Take your motor to Clyde, and he'll first test it on his trick Quillen Engineering 200A dyno. Then, using a lathe given to him by Mike Reedy, he'll cut your comm for you if it needs it. He'll even give you a new pair of brushes if yours are shot. Offer to pay Clyde for his services, and he'll refuse.

Why would someone drive all the way to Scottsdale from Tulsa just to tune motors for free? Clyde didn't even take an R/C car to race; he just likes helping the racers.

Clyde first became interested in the R/C hobby about seven years ago. He raced full-scale Pro Hydros and tunnelhull boats back in the late '40s, and then he worked with his son, Kenneth, on his boat-racing career (Kenneth won several national boating championships). After discovering R/C boats, Clyde soon found that there was little boating activity in the Tulsa area. That led him to R/C cars, and he has been an avid racer ever since.

Clyde travels to as many races as his schedule allows, and he can always be found helping others. Just how busy was Clyde at the Cactus? He estimates that, by Saturday, he had dyno'd about 300 motors and had "cut" more than 55.



ADVERTISEMENT

SANYO

NEW SANYO RC-1700 ANSWERS REQUEST FROM R/C RACERS

One of the nicest things about having Sanyo as the major supplier of R/C batteries is that the folks there pay attention to the wants and needs of the R/C industry, and especially to those of R/C racers. When R/C racers asked for a higher capacity and a more consistent cell than the 1700SCRC, Sanyo listened to their requests. The result is the RC-2000. The RC-2000 cell utilizes all the latest Sanyo technology and is a milestone in Ni-Cd cell performance. No one has before been able to produce a cell well over the 2000mAh capacity mark with the voltage output and resistance figures achieved by Sanyo. These cells had existed before, but their voltage output was always too low to be of any use for R/C racers.

Sanyo has once again listened to your comments and now introduces a mid-priced cell with better performance than the mid-price-level standard, the N-1400SCR. The cell is the RC-1700 that you have probably just begun to hear rumors about. This all-new cell uses the same technology as the highly successful RC-2000, and this allows it to offer more performance than the mid-priced N-1400SCR. The best part is it that should be somewhere around the same price.

This new cell will definitely fill the gap between the 1300 sport cells and the all-out, state-of-the-art RC-2000. With improved performance over the N-1400SCR, the RC-1700 will be very suitable for street racers who are looking for more run time and for casual R/C racers who compete or run weekly. Serious racers will still demand the performance criteria that only the RC-2000 can meet.

Thank you, Sanyo, for listening and responding to R/C racers!

*Addresses are listed alphabetically in the Index of Manufacturers on page 201. ■

HOME
PROJECT
BUILT

DRAG TRUCK

by Kevin Hetmanski



"Make mine a big block!"

G

ORDON PETWAY has been an R/C'er for about 10 years.

Because he's always looking for ways to improve his vehicles,

Gordon decided it would be easier to build them from scratch.

That's exactly what he did with this killer drag truck, and let me assure you, it is wild.



HIGH-SPEED CHASSIS

The scratch-built, double-deck chassis is made of G10 fiberglass and titanium alloy. The fiberglass sub-chassis is bolted to a machined titanium motor-mount plate. Gordon used titanium because it's lighter and stronger than all other metals, and it also makes a great heat sink for cooling the engine. The front of the chassis is reinforced by a fiberglass upper plate that doubles as a radio/servo tray. The top piece of the chassis is $\frac{1}{16}$ -inch thick, and the bottom one is

$\frac{1}{8}$ -inch thick. Aluminum posts that Gordon turned on his lathe hold the upper and lower chassis plates together. After assembling the chassis, Gordon lightened it by removing all excess material with a milling machine.

QUICK STARTS AND STOPS

Gordon borrowed the gears, pulleys and disk brake from an Associated* RC500 $\frac{1}{8}$ -scale gas vehicle; he fabricated custom blocks

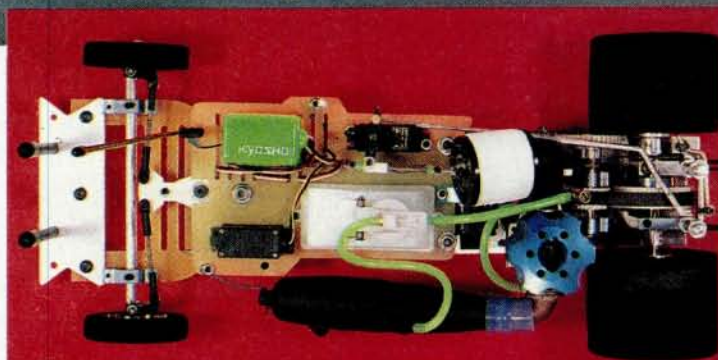
Left: creator Gordon Petway poses with his rig. Not only is Gordon the master of homebuilts, but he's a heck of a nice guy, as well. He claims that if there was a way for him to earn a living doing R/C, he'd quit his job in a second.

PHOTOS BY WALTER SIDAS

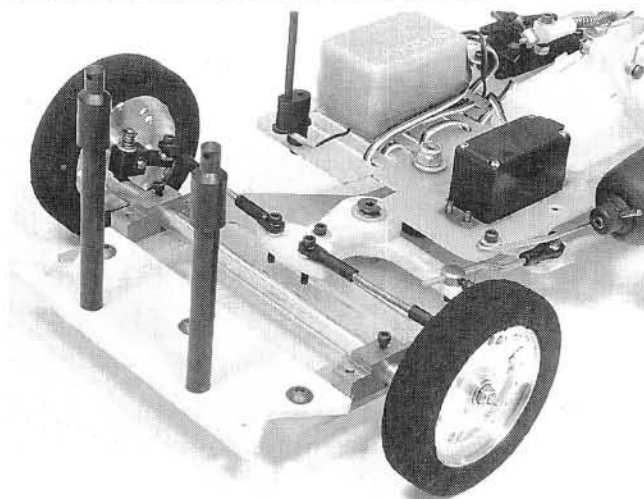


Here's a bird's-eye view of the chassis. This thing is so well-done, it actually looks like a kit. Gordon is a very neat builder, as you can see from this well-organized chassis. The front end has a kingpin/coil-spring suspension, but the rear end remains rigid—a typical drag setup.

to support the gears. In addition, he made aluminum axle carriers to house the straight steel axle. Since drag trucks don't need to make sharp corners, a differential is not needed. Therefore, he did not use the diff balls and rings, and the main drive-gear/pulley is attached to the axle. An Associated disk brake (also taken from an RC500) slows the beast down. Gordon even drilled out the brake disk to lighten it and help it cool off more efficiently—talk about being thorough!



HOMEBUILT PROJECT: DRAG TRUCK



The drag truck's front end is very similar to that of a typical pan-car. Check out the scratch-built aluminum crossbeam front end; caster is completely adjustable. Note the Associated RC500 steering bellcrank system; the front bicycle wheels were made from scratch.

WHAT SUSPENSION?

The front suspension is a garden-variety kingpin/coil-spring affair, and Gordon made an adjustable aluminum beam and aluminum mounting blocks. A pair of Bolink* steering blocks slide onto vertically mounted kingpins that are fastened to the aluminum beam. Pan-car coil springs provide the damping.

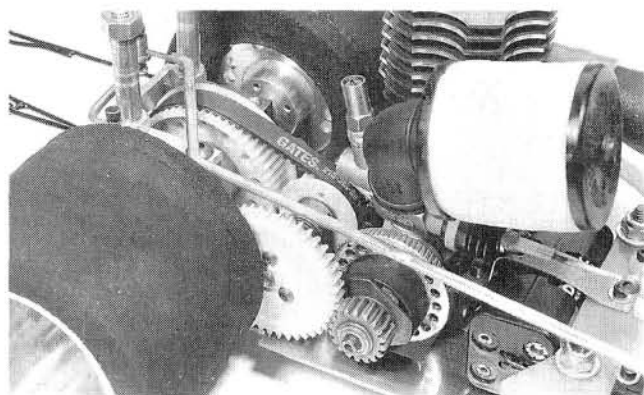
The rear end of the drag truck is rigid; it has no suspension. The fiberglass chassis flexes inward when the truck is launched off the line; this helps the rear tires dig into the track and, in turn, provides more traction.

KEEP THOSE TIRES ON THE GROUND

To keep the front wheels on the ground where they belong, Gordon handcrafted a really nice-looking wheelie bar. He shaped it by bending $\frac{3}{32}$ -inch music wire; then he used silver solder to weld the pieces together. One end of the wheelie bar is bolted onto the motor plate, and a pair of slot-car wheels and tires rotate on an $\frac{1}{8}$ -inch shaft soldered to the wheelie bar's other end.

BIG BLOCK POWER

Gordon wanted his truck to be blazing fast, so he bolted an O.S.* .21 RZ-B racing engine onto the motor plate. An O.S. RB063 tuned



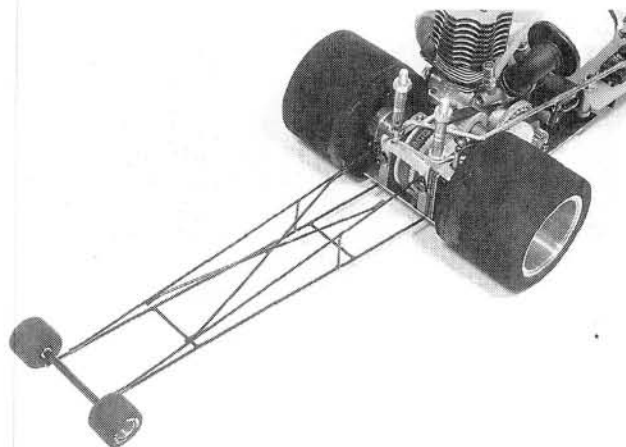
pipe lets the engine breathe more easily and gives it a little extra "go power." To make the exhaust flow even better, Gordon made his own exhaust header from a 90-degree brass pipefitting. He used a Kyosho* Inferno MP-5 fuel tank to supply fuel to this nitro-burning monster of an engine, but I don't know why. Most drag-racing vehicles use very small tanks that hold just enough fuel for a pass or two on a scale drag strip. I guess Gordon wanted more play time!

CONCOURS-WINNING APPOINTMENTS

To dress up this ballistic vehicle, Gordon made aluminum rims on his lathe. He machined the rims from solid aluminum bar stock, making them exactly the size he wanted. He used $\frac{1}{8}$ -scale rubber foam tires all around. The rear tires weren't wide enough to fit the rims, so Gordon cut sections off another set and glued them to the tires to make them right. The low-slung truck body is actually an MRC* Thunder King that was painted by Richard Muise of Motion Graphics*.

WHO NEEDS FANCY RADIO GEAR?

Gordon uses a Futaba* Magnum Jr. radio to guide this missile down the track. Believe it or not, standard Futaba S148 servos handle the steering and throttle chores. According to Gordon, the Magnum Jr. has the features gas-powered cars require, i.e., steering and throttle dual rates, and high-speed and high-torque servos are not necessary because the car is designed to travel in a straight path.



PERFORMANCE

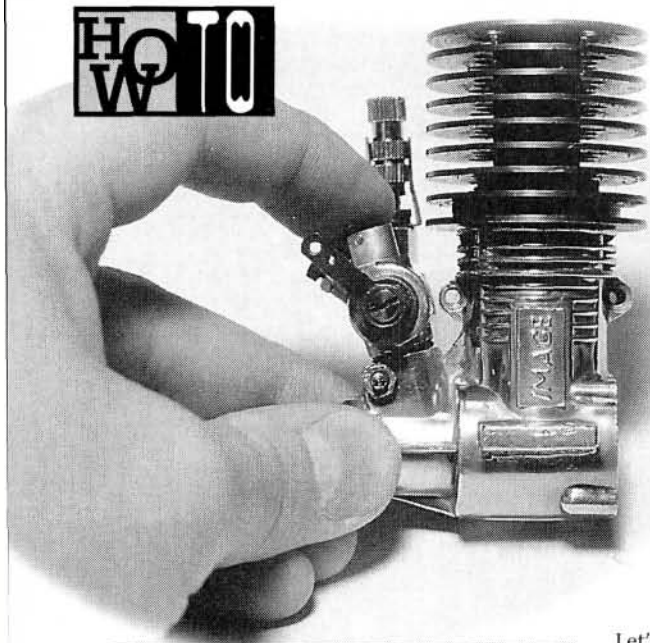
I'll bet you're wondering just how fast this truck really goes. Well, how does zero to 65mph in under 3 seconds sound? Hey, this was verified by police radar! According to Gordon, the truck can hold a wheelie down the entire length of the drag strip. He continues to experiment with different wings, gear ratios and types of nitro fuel, and he's convinced he can make this truck go a lot faster.

FINAL THOUGHTS

It took Gordon only 20 hours to complete this truck. I've spent that much time building a kit! Gordon is truly an interesting guy, and he has a wealth of knowledge when it comes to building from scratch. He has a few other wild homebuilts in the works, and you may even read about them in the near future.

*Addresses are listed alphabetically in the Index of Manufacturers on page 201. ■

The drive train is a little crowded, but boy, does it work well. Most of the gears and shafts were borrowed from an Associated RC500. Check out how Gordon drilled out the flywheel to save weight. The two large nuts in front of the air filter are tweak adjustment screws. Although the rear end is rigid, the chassis is designed to flex, which allows the rear tires to dig into the track at takeoff.



The finished product, partially assembled. Not as boring as your typical glow engine, eh?

Polish Glow Engines

by Joe Ringeisen

Give your gas car that "hot-rod" look

PREPARATION AND SUPPLIES

Let's look at what you'll need. The job will go faster with a Dremel* tool and a selection of polishing wheels. The choice is up to you, but I recommend the

wheels made of several circular pieces of cloth that are sewn together. These are the softest, and I've had the best luck with this type. There are others, such as the compressed cotton wheels, but I think they're a little rough for our purposes. After all, the idea is to polish the surface and make it look as chrome-like as possible. Remember, the casings on glow engines are made of aluminum, which is a relatively soft metal. It's pretty easy to scar the surface of the casing, so take care.

Next on the list is polishing compound. I recommend Mother's Brand 8; I've had the most luck with this one. There are several brands on the market, but if you use a Dremel tool, be sure to use a cream-type compound, and read the directions and warnings on the polishing compound before you start. You'll also need some pieces of soft cloth for buffing off the polishing compound and for final polishing the surface.

Don't forget that if you'll be working with a Dremel tool, you'll need to wear

safety glasses. Trust me on this; the Dremel will throw the polishing compound around quite a bit, and you don't want to get any of it in your eyes. I also recommend that you wear an old T-shirt and do the polishing outside, not in the living room.

GETTING STARTED

Remove the engine and disassemble it. Be careful not to lose any parts; also, note how the engine comes apart so you'll know how it goes back together. Remove the piston, sleeve, crankshaft and carburetor. Although you can remove the bearings, as long as you're careful, it's not really necessary. It's important not to get polishing compound, dirt, or anything else into the bearings. If you do, a good blast of motor spray will usually clear out the crud. Speaking of motor spray, the surface of the engine will have to be perfectly clean and free of grease before it's polished, and the best way to do this is to use motor spray.

Once the engine is completely clean, use a rag to apply the compound to its surface. Next, mount one of the polishing wheels in the Dremel tool chuck. Now carefully use the low-speed setting (15,000rpm) to polish the outside of the engine. The trick is to polish it with the wheel until its surface has a dark-gray "haze." Don't spend too long on one area, or you could scar the

HOT-RODS. They're as American as anything, and they seem to have a personality all their own. Hot-rods are owner-modified vehicles in which custom looks and added performance go hand in hand. What's one of the things that people think of when they think of hot-rods? The abundance of chrome and polished metal.

Most of us in the R/C car hobby know and love hot-rods. But somehow, R/C hot-rods just don't have the chrome and polished metal look of the full-size ones. A while back, I came up with the idea of polishing the glow engine on a nitro-powered R/C car. Sound interesting? Well, follow along, and I'll show you how to give your R/C car that hot-rod look by simply polishing your engine.

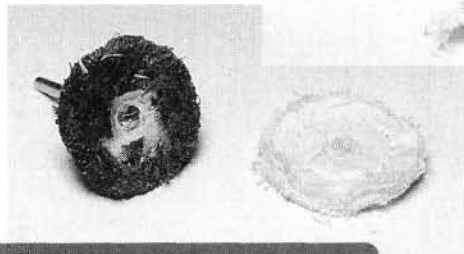


What you'll need to polish a glow engine: a soft rag, a Dremel tool and cotton polishing wheels. You'll also need some cream-type polishing compound.

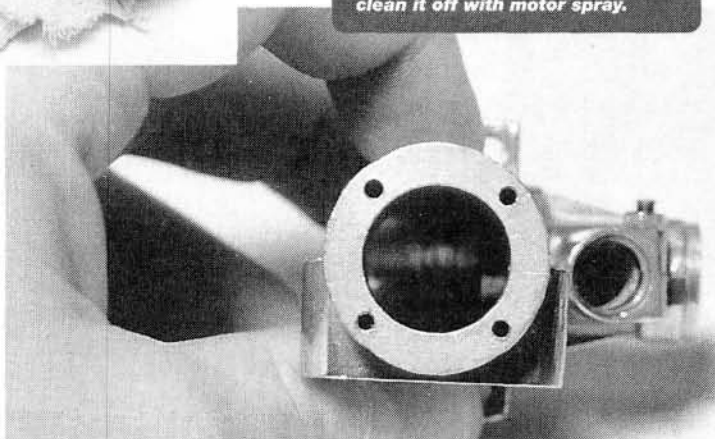
If you don't have a Dremel tool, you can always polish the engine by hand. If you do, use X-Treem Metal Polish or the same cream-type compound as you would use with the Dremel tool.



When you polish the outside of the engine, don't get any polishing compound on its inside. If you do, clean it off with motor spray.



The polishing wheel on the right hasn't been used, while the one on the left was used to polish the engine. That's what the wheel will look like when you've finished.



aluminum. After a haze has formed on the surface, shut off the Dremel and wipe the polished area with the rag. Do a little at a time, rather than trying to do the whole engine at once.

Move around until you've polished the entire thing. You'll probably discover some areas that you can't reach with the polishing wheel; this is where cotton swabs come in handy. Dip a swab in the compound and polish the hard-to-reach areas of the engine with it. Again, polish until a dark-gray haze forms, and then wipe it with the rag. If you can't reach the area that you just polished with the rag, use another cotton swab to polish it.

But what if you don't have a Dremel tool? That's simple enough to solve. The Dremel tool makes the job faster and easier, but it's certainly not essential. Using the compound and rag, you can polish the engine by hand. It will take longer, but the results will be pretty much the same.

If you decide not to use a Dremel tool for polishing the engine, then you do have another option: use a different type of polishing compound. You won't be limited to using a cream-type compound. I recommend X-Treem Metal Polish. It's a cotton cloth that has the polishing compound already in it.

WHAT CAN YOU POLISH?

You can polish most of the outside of the engine. The engine casing is the most obvious thing, but you can also polish the carburetor body. Take the carb apart completely, and when you put it back together, make sure that there are no bits of polishing compound left inside. Because the carb on these engines is pretty small, that's a bit tougher than it sounds. Before you start to polish it, stuff a piece of cloth inside the carb body. This also effectively keeps the compound out of the bearings in the engine case. If you get compound in the carb body or in the bearings, use a little motor spray to wash it out.

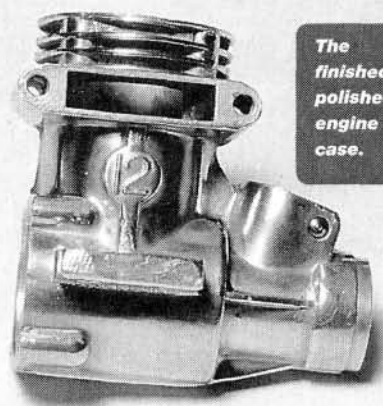
The cylinder head is a different story. Most glow engines come with anodized-aluminum heat-sink heads. Because they've been anodized, you can't really polish them. You can polish the top of the head a little, but because of the anodized coating, it will never have the nearly mirror-like shine of the rest of the engine.

KEEPING THE SHINE

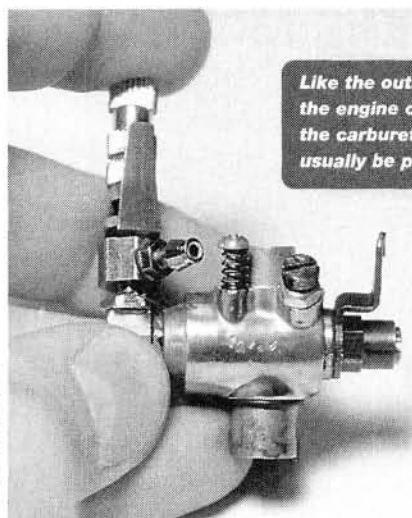
If you polish any aluminum, it eventually loses some of its shine. It's similar to the way sterling silver tarnishes over time. Aluminum doesn't really tarnish like silver, but it does lose some of its shine.

So what can you do about this? To be honest, not all that much. The best thing you can do is to just keep polishing. The idea here is to "stay ahead" of the loss of shine—preventive maintenance, if you will.

At any rate, certain products help metal to keep its shine after it has been polished. Try X-Treem Metal Sealant. You apply it to a soft rag, rub it on the aluminum, and then buff it off. According to the product's



The finished, polished engine case.



Like the outside of the engine case, the carburetor can usually be polished.

label, it thinly coats the metal and prevents it from tarnishing. I've used it, and it seems to work pretty well, but it's no substitute for re-polishing.

Now you, too, can give your R/C car that hot-rod look you've been yearning for. Polishing a model glow engine is a lot simpler than it actually sounds. So break out the rags and start polishing; that extra shine might very well blind your competition!

**Addresses are listed alphabetically in the Index of Manufacturers on page 201.*

racing

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This is the R/C action as **you** see it.

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That's what "Grassroots" means—from the roots—the ground up; and that means **YOU!**—real, live R/C'ers—readers—an entire page of your stuff! Show the world—yes, everywhere from here to there—what you and your R/C friends are doing. Wanna brag? Here's the spot. Go on; show us!

Send photos with captions to "Grassroots Racing," Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606.

call now!

Whether you're a dealer or just a bunch of fun-lovers in search of a race program, call now! Here are a few hot-line numbers to call if you have any questions, or if you'd like to start a program in your area.

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(404) 963-0252

**Tamiya R/C
Championship
Series**
(800) TAMIYA-A

**Kyosho R/C
Sport Racing**
(800) 682-8948
ext. 085F

**Hobby Shack
Parking Lot**
(714) 964-8846

**Hobby Town USA
Parking Lot**
(402) 434-5050

**Trinity Street
Spec Series**
(908) 862-1705



Club action at its best

In Lincoln, NE, the organizers at Hobby Town USA wanted to attract racers for as many classes as they could, so they modified their track to accommodate many types of R/C vehicles. Wall to wall, the 12-foot-wide dirt-oval track measures 50x120 feet and has 72-foot straights. The unique off-road course laid out inside the dirt oval uses about 90 percent of the track.

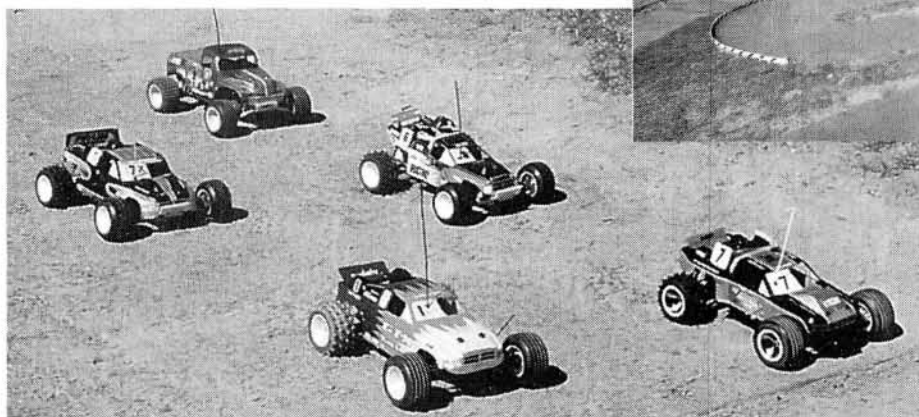
As you can see, the focus at Hobby Town's track is family, fun and sportsmanship. Recognizing the demand for more entry-level races, the organizers developed the "hobby stock" class in which less experienced racers (two years or fewer) are allowed to run any car or truck with a stock 24-degree motor. Stock cars typically run 29 laps to win the A-Main and 28 to stay in the field. Below: two aspiring racers watch the action from the sidelines.



Above: Tuesdays are the big nights at Hobby Town, and turnouts boast anywhere from 45 to 80 entrants. Here, racers at the starting grid get ready to hit the throttle.

Home-Grown R/C

What started as the Woody family's modest backyard track—for their five gas trucks—was excavated to meet NORRCA layout requirements and soon became home to the Nisqually R/C Club of Yelm, WA. It's 415 feet long and has a 100-foot straightaway, banked turns, numerous jumps, a rhythm section, double drop jumps, a tabletop and one off-camber turn. On a busy day, the track's surface—3 inches of topsoil covered with 3 inches of easily thrown sandy loam—requires raking, rolling and watering every couple of hours. "But it's worth it!" says Martin Woody.



Left: five "expert" gas trucks line up for the first heat of the day. Although the Nisqually club sees mostly gas racing, they run some electric classes, too.



Above: novice-class drivers concentrate on making their way around a temporary track laid out with old fire hose and plastic track markers. Regularly run classes include novice, oval, gearbox, truck, supertruck, NASCAR and 1/10- and 1/12-scale touring car. ■

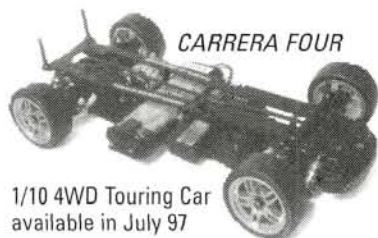
Seven-Year Stretch

Seven years ago, when the folks at Rohnert Park, CA, started their Sunday Challenge races, they were ahead of their time; now, they have one of Northern California's longest-running race series. Hosted by Jake's Performance Hobbies (shown here in the background), the Sunday Challenge season starts with the Warm-Up and ends with the Challenge Championships. This year, a record 97 entrants opened the season, and to mark the occasion, many of them gathered for this end-of-day photo (below).

JAKE'S PERFORMANCE HOBBIES



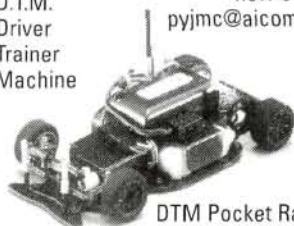
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OFNA ULTRA WORLDS GT

(Continued from page 64.)

the engine for maximum power. I had to run it rich to keep the engine cool, but this also slowed the car down a little. Nevertheless, it was still very competitive.

How'd it jump? The Worlds GT jumps excellently and maintains a sturdy stride as it lands. It needed a little throttle correction at the lip of the jumps and tended to land slightly nose-down, but thanks to the front kick-up, the car pulls out of dives instead of plowing into the track surface. Throughout the day, the double jump on the straightaway had posed a threat to many cars, but with the right entrance, the Worlds GT conquered the obstacle as if it were just a couple of pebbles in its path. It steered well through the turns and exhibited a controlled 4WD drift whenever I yanked the throttle when taking a sharp turn.

The stock large-pin tires worked well on the freshly rototilled track and kicked a lot of dirt up into the unsuspecting turn marshals' faces.

At the end of the day, they piled the top 10 racers into the A-Main. I got off to an incredibly good start, but I forgot to recharge the receiver battery pack, so it couldn't last the necessary 10 minutes.

Of course, I went back the following week to claim my GT's first A-Main win. To be honest, I only won because *Car Action's* editor-in-chief, Frank Masi, had

a bad encounter with the retaining fence. Before that, his Kyosho MP-5 was merely an eighth of the track ahead of me!

FINAL THOUGHTS

I opened this article by making a bold statement that this car is a winner straight out of the box; and indeed it was. But I did have a few minor problems—more the results of my negligence than the fault of the car. The hubs are held on the axle by setscrews; I suggest that you apply extra, extra, extra (do you get the point?) threadlock to these screws. On my car, these screws loosened, and the hub slid out enough to cause the axle to bend.

You should also take care of the wing and mount, which may become fragile in cold weather. In my case, the full-throttle endo proved devastating: the two parts shattered.

Other than that, the car's overall quality is excellent. The OFNA Ultra Worlds GT is one of the most comprehensive 1/8-scale car kits on the market, and it's jam-packed with hot features that are usually hop-ups on cars that cost considerably more.

*Addresses are listed alphabetically in the Index of Manufacturers on page 201.

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WHAT'S new



PROTOFORM

Aurora GTS-1 for Associated's DS

This detail-oriented body was designed to resemble those used by the 1996 IMSA GTS-1 champion Aurora team. Specifically created for the DS, it will also fit on wide-format sedan and "outlaw" oval racers. Its performance-enhancing design provides a low center of gravity as well as an aggressive front spoiler, and its realistic look includes detailed lines and decals. The body comes with large wing and window masks.

Part no.—1412; price—\$19.95.

Protoform; distributed by Pro-Line, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.

OPS

3.5cc SPA Buggy Pro Engine

Designed to maximize the performance of your 1/8-scale buggies—especially the Kyosho MP-5 Inferno—the SPA Pro engine features ABC construction for maximum output and rugged durability; an integral pilot shaft, which allows you to mount the clutch directly on the engine; ball bearings; a high-performance slide-valve carb; and an oil-treated air filter for superior dirt trapping.



Part no.—OPSG0560; price—\$399.99.

OPS; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-0008.

MIP

Lite Drives

Lightweight, durable and strong, these Lite Drives—designed for Team Losi and Associated cars—will help you increase acceleration and overall top speed. They are constructed of high-grade steel, heat-treated and finished with a black coating. Each set includes a set of polished diff rings.

Part nos.—1188 (RC10, RC10T, RC10DS), 1189 (RC10T2, RC10GT), 1190 (RC10B2), 1191 (Losi cars and trucks); price—\$21.95.

MIP, 746 E. Edna Pl., Covina, CA 91723; (818) 339-9008; fax (818) 966-2901.



DYNAMITE

Transmitter Ni-Cd Conversion

Stop buying alkaline AAs for your transmitters! Hook Dynamite's Ni-Cd conversion to the battery slot, and you can run Ni-Cds in place of the alkalines indefinitely. The converter comes with Sanyo 600mAh cells and a 300mAh wall charger and is available in both a JR version for use with R-756, Python, Alpina and Beat Gear transmitters and a universal version for use with Airtronics, Hitec, Traxxas, Futaba and KO Propo transmitters.

Part nos.—DYN1900 (JR version); DYN1910 (universal version); price—\$29.95.

Dynamite; distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 352-1958; fax (217) 352-0355.



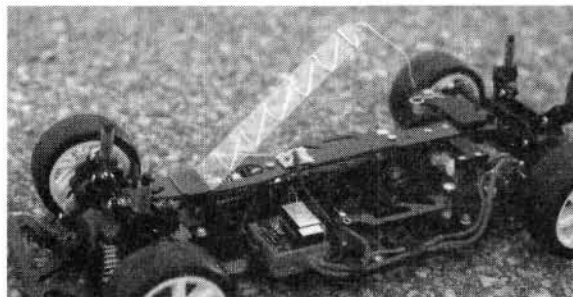
G-FORCE RACING

Stealth Antenna System

Rather than stuffing your entire antenna under your body shell—as so many racers do—with this antenna system, you can conveniently conceal your car's antenna without losing the frequency. The Stealth System can hide up to 12 inches of antenna wire.

Part no.—2007; price—\$4.50.

G-Force Racing, 1661 Denison St., P.O. Box 76614, Markham, Ontario, Canada L3R 0N5; (905) 477-1338.



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DMW

Com-Lube

Extend your motor's life by applying this non-solvent-based lube to your comm. By lowering drag and heat in your motor, the lube will decrease comm and brush erosion. It is safe on modified as well as stock motors and has a boiling point of 500 degrees.

Part no.—0002; price—\$4.95.

DMW, 5938 McIvey Way, San Antonio, TX 78233; (210) 653-9572.

PSE

Phaze 1 R/C Oval Car

The first car ever released by PSE, the Phaze 1 offers an aerospace-grade graphite chassis, braces and top and bottom pod plates. It achieves incredible cornering speeds, and it has adjustable rear roll steer and seven battery slots for adjustable weight distribution. The kit also has a number of top-grade performance parts.

Part no.—96105; price \$425.

PSE; distributed by Parma Intl., 13927 Progress Pky., North Royalton, OH 44133-4394; (216) 237-8650; fax (216) 237-6333.



TRINITY

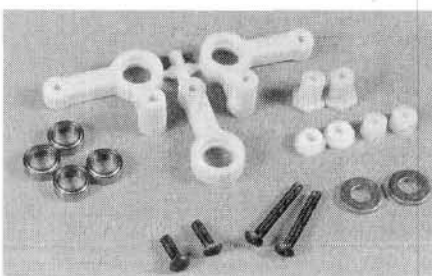
Cutman Team Kinwald Big Boy Off-Road Wide Track Motor Screws

These motor-mounting screws have a machined aluminum washer that increases their surface area for stronger motor mounting. The set comes with two screws, two washers and a wrench and can be used with all off-road and touring cars as well as some on-road cars.

Part no.—TK3020;

price—\$1.99.

Trinity Products Inc., 1901 E. Linden Ave., #8, Linden, NJ 07036; (908) 862-1705; (908) 862-6875.



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Ball Bearing Steering Kits for Sedans

Get full ball-bearing steering from your HPI RS4 and other sedans with this kit, which includes everything you'll need for a complete conversion.

Part no.—2189; price—\$32.95.

Factory Works, 505 N. Smith, #105, Corona, CA 91720; (909) 735-5516; fax (909) 735-5642.



REEDY

Tri-Sonic Motors

The latest in the Reedy line of modifieds, these motors have 1.4mm-thick cans, high-strength "Z" magnets, a high-tech brush-damping system for longer comm life and standard commutator design. Each motor has been hand-wound, epoxy-dipped, zero-gravity-baked and epoxy-balanced for absolute precision.

Part nos.—323 ("?" 10-turn double), 324 ("Y" 10-turn triple), 326 ("93" 9-turn triple); price—\$90.

Reedy Modifieds; distributed by Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744.

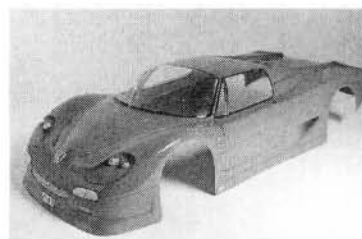
FEWER

Ferrari F-50 Body with Adjustable Wing and Decal Set

Modeled after the Ferrari special-edition full-size car, this body comes with an adjustable wing for varying downforce and includes large side dams for side traction. In addition to having a slick one-of-a-kind appearance, this body is well-equipped for race-winning performance. It also has a decal set. It will fit all narrow (180 to 190mm) touring-car chassis.

Part no.—FR-4013; price—\$24.99.

Fewer Intl.; distributed by R/C Imports, P.O. Box 7009-152; Lafayette, CA 94549; phone or fax (510) 284-5778.



Key to Symbols

-  Indoor
-  Outdoor
-  Off-road
-  Oval
-  Dirt oval
-  Carpet
-  Concrete
-  Asphalt
-  On-site hobby shop
-  AC power
-  Auto lap-counting
-  Food available

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Berry R/C Raceway, Main St., Berry, AL 35543; Ronny or Don, (205) 932-3189

Hobbytown USA Raceway, 450-Q Schillinger Rd. N., Mobile, AL 36608; Rob & Kari Baker, (334) 633-8446

Phenix Raceway & Hobby, 2006 Opelika Rd., Phenix City, AL 36867; Chris Watson, fax (334) 298-9786

R/C Hi-Tech Raceway, 3303 Meridian St., Huntsville, AL 35811; Rick Chambers, (205) 539-1347.

Lagoon Park R/C Raceway, 2730 Lagoon Park Dr., Montgomery, AL 36109; Alex Love, (334) 272-6438

R/C Thunder Tracks, 1530 Schillingers Rd., Mobile, AL 36618; Jerry or Steve Hurst (334) 649-4302

Sunbelt Hobby Center, 2015 Memorial Pkwy., Huntsville, AL 35801; Chris Wilson (205) 539-3191

ALASKA

Alaska Indoor R/C Auto Raceway (AIRCAR), 600 Arctic Blvd., Anchorage, AK 99518; Mary Slimpson, (907) 561-7733

Fairbanks R/C Car Club, 510 Janeau Ave., Fairbanks, AK 99701; Dan Anderson, (907) 456-5494

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Cottonwood R/C, S. 6th St., Cottonwood, AZ 86322; Sal Cirincione, (520) 567-8830

Finish Line Raceway, 7025 E. 21st St., Tucson, AZ 85710; Spoon-Brandon-R/C, (520) 747-3633

G&S Raceway, 967 Hancock, Bullhead City, AZ 86442; Bob Olsen, (520) 758-1100

Havasu R/C Raceway, 1400 S. Smoketree (Rotary Park), Lake Havasu, AZ 86403; Jeff Roe, (520) 855-2226

HobbyTown Mountain Raceway, 1500 E. Cedar Ave., Cedar Hills Shopping Center, Flagstaff, AZ 86004; Richard, (520) 214-9887

HobbyTown Raceway, 9180 E. Indian Bend Rd., Scottsdale, AZ 85250; Dennis, (602) 948-3946

HobbyTown Raceway, 1915 East Baseline Rd., Gilbert, AZ 95234; Kenny, (602) 892-0405

Hobbytown Raceway, 1102 E. 22nd St., Tucson, AZ 85704; Adam Crippen, (520) 882-8888

Quarter Flash's Squirrel' Dirt Raceway, 16301 S. Santa Rita #C, Sahuarita, AZ 85629; Dave or Randy, (520) 625-9274

R/C Sports Mania, 3550 N. 35th Ave., Phoenix, AZ 85017; Brian Dick, (602) 278-3671

Scottsdale R/C Raceway, 3023 N. Scottsdale, Scottsdale, AZ 85251; Scott Anfinson, (602) 945-2186

Speedway Hobbies, 2710 N. Steve's Blvd., Suite #8, Flagstaff, AZ 86004; Gary McAllister, (520) 556-0710

Thunder Mountain R/C, 1325B Plaza Mavia, Sierra Vista, AZ 85635; Wayne Tuthill, (502) 459-4173

USA Speedway, 5947 W. Alameda, Glendale, AZ 85310; Michael Fleek, (602) 516-1398

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Grand Slam Superspeedway, 5300 S. Zero St., Ft. Smith, AR 72901; Bryon Shumate, (501) 648-1994

R/C Motorplex, 204 Best Industry Dr., Jonesboro, AR 72401; David Hill or Kevin Brady, (501) 931-3278

Superior Offroad R/C Club, 2400 Bowman Rd., Little Rock, AR 72211; John Reynolds, (501) 778-7875

Sparks R.C. Raceway, 7194 Greene 721 Rd., Paragould, AR 72450; Tommy Sparks, (501) 239-3606

CALIFORNIA

A-Main Racing, 4309 North Cedar Ave., Fresno, CA 93776; Keith Gerhke, (209) 225-8001

California City R/C Car Track, 8349 Jacaranda Ave., California City, CA 93505; (619) 373-3765

Cameron Park Raceway, 1305 Cameron Ave., West Covina, CA 91790; Carl A. McVey, (818) 962-1120

Cats West/Hawk's R/C Raceway, 1201 West 10th St., Antioch, CA 94509; Jerry Winkelbaver, (510) 779-1665

Cycle Art Raceway, 2211 N. Pleasant Way, Fresno, CA 93705; Jesse Shapiro, (209) 233-3665

DiscountHobby Warehouse, 7750 Convoct Ct., San Diego, CA 92111; Gary Guest, (619) 560-9633

Freedom Park Raceway/Ventura Roadrunners, Freedom Park Dr., Camarillo, CA 93010; Wayne Evans, (805) 656-8456

Geotek R/C Racing, 92 Aero Camino, Goleta, CA 93117; David Jones or Mike Atherton, (805) 961-2178; fax (805) 961-2179

Gold Nugget Raceway, 4650 Skyway, Paradise, CA 95969; Marvin's R/C Hobbies, (916) 877-7363

Greater Los Angeles R/C Racing Club, 3756 Cardiff Ave., #305, Los Angeles, CA 90034; Nikko Ko

Hobby Central Raceway, 34255 P.C.H., Unit 107, Dana Point, CA 92629; John, (714) 488-8095

Hobby Paradise Raceway, 1880 Art Gonzales Pkwy., Selma, CA 93662; Steve Keiser, (209) 896-4804

HobbyTown, Parktown Plaza Shopping Center, 1350 S. Park Victoria Dr. #21; Milpitas, CA 95035; (408) 945-6524

Hobby Warehouse, 5500 So. Watt, Sacramento, CA 95828; Roger Hubbard, (916) 381-7587

Hot Rod Hobbies, 25845 San Fernando Rd., #21, San Jose, CA 95130; Rod Weisbaum, (805) 255-2404

Jake's Performance Hobbies, 6650 Commerce Blvd., #21, Rohnert Park, CA 94928; Jake, (707) 586-3375

JC High Desert Raceway, Gorgonio Rd., Phelan, CA 92329; JC Fletcher, (619) 868-4834

Just for Fun R/C Raceway, 509 S. State St., Ukiah, CA 95482; Don, (707) 462-7305 days

KW Raceway, 5630 Ager Rd., Montague, CA 96064; Keith Wilson, (916) 459-3787

Lake Tahoe Raceway/Sierra Hobbies & Raceway, P.O. Box 9969, South Lake Tahoe, CA 96158; Mark Osser or Greg Smith, (916) 541-4555

Loki Raceway & Hobbies, 1875 Joe Crossen Dr. #8, El Cajon, CA 92020; Ed Mullen, (619) 562-7757

Lucerne Valley Raceway, 32800 Old Woman Springs Rd. #4, P.O. Box 2047, Lucerne Valley, CA 92356; Frank Rodrique, (619) 248-7305

M n M Hobbies, 4225 Prado Rd., Suite 103, Corona, CA 91720; Joe Stanovich, (909) 272-3545

Nor-Cal Mini-Speedway, 519 Bush St., Woodland, CA 95695; Steve Van Atta, (916) 668-5678

Perris Recreation R/C Track, 120 N. Perris Blvd., Perris, CA 92370; (909) 943-6603

R/C Racing Center and Hobbies, 9842 Channel Rd., Lakeside, CA 92040 (San Diego County); Russ or Cindy Escalera, (619) 443-2270

R/C Sports, 759 E. Monte Vista Ave., Vacaville, CA 95688; (707) 446-5555

Race Prep Raceway, 20115 Nordhoff, Chatsworth, CA 91311; Steve Dunn, (818) 709-6800

Racer's Haven Raceway, 7401 White Lane #12, Bakersfield, CA 93309; Martin Buchanan (805) 835-0441

Rams 1/8-scale Gas, Mission College, Lot B, 3000 Mission College Blvd., Santa Clara, CA 95054-1897; Ken Kimbrow, (408) 238-2089

Ranch Pit Shop, 1655 E. Mission Blvd., Pomona, CA 91766; Ken Shintani, (909) 623-1506

Revelation Raceway, 4871 State St., Montclair, CA 91762; Tim Bump, (909) 464-8247

Ripon R/C Speedway, 701 N. Acadia Ave., Ripon, CA 95366; Dan Tanis, (209) 599-5160

Simi Valley Groundpounders, 205 Tierra Rejada Rd. (behind Simi Valley Drive-In), Simi Valley, CA 93065; Jack Kasten, (805) 584-8211

So. Cal R/C Raceway, 11930 Valley View St., Garden Grove, CA 92645; Jim Blauvelt, (714) 892-0088

Stockton Raceway, 3133 N. Adart Rd., Stockton, CA 95215; Ultimate Hobbies, (209) 472-1991

Team Air Racing Club, 18208 Imperial Hwy., Yorba Linda, CA 92686; Don or Nicky, (714) 579-7488

Track Heaven, 6196 Child's Ave., San Diego, CA 92139; Loure, 475-2020

Tri-Valley Auto Racers, Livermore Elks Club, 940 Larkspur, Livermore, CA 94550; Roger Van Maren, (510) 449-0982

Ultimate Hobbies, 2143 N. Tunstun Ave. #6, Orange, CA 92665; Cliff Murukami, (714) 921-0424

Valley R/C Racepark, 146 S. Santa Fe St., Hemet, CA 92344; Valley Wide Recreation, (909) 654-1505 or 658-4322

Visalia R/C Speedway, 602 East Ace

COLORADO

MHOR R/C Raceway, 15540 East Batavia Dr., Aurora, CO 80011; Jess Brockman, (303) 343-0151

S&T R/C Raceway, 323 Auburn Dr., Colorado Springs, CO 80909; Tim Bishop, (719) 574-2910

Valley West R/C Club, 2202 I Road, Grand Junction, CO 81505; Waymond Williams, (970) 242-8846

CONNECTICUT

E.A.R.T.H., 2380 Main St., Rocky Hill, CT 06067; Ziggy Kwasnicki, (860) 296-5418

East Lyme R/C Kar Klub, Society Rd., East Lyme, CT 06333; Steve Brown, (860) 739-2911

K/N R/C Speedway Inc., West St., Stafford Springs, CT 06076; (860) 684-9896

NERCAR, 36 Glendale Rd., Enfield, CT 06082; Phil Olsson, (860) 627-5410



R/C Madness, 640 Enfield St., P.O. Box 64, Enfield, CT 06082; Christopher Marcy, (860) 741-6501



DELAWARE

Eastcoast Off-Road, Rt. 3 Box 256 A, Laurel, DE 19956; Darrin Shockley or Steve Nelson, (302) 875-8160



Hobby Stop Speedway, RD4, Box 100, Rte. 13, Seaford, DE 19973; Remy Haynes, Jr., (302) 629-3944



FLORIDA

B+T R/C Central, 811 Playground Rd., Ft. Walton Beach, FL 32547; (904) 863-1666



Bransford R/C Speedway, Rt. 3, Box 240, Bransford, FL 32008; (904) 935-0758



Broward County R/C Race Club, Mills Pond Park, Ft. Lauderdale, FL; Ed Decembere, (954) 525-3304



Coral Springs Roadrunners, P.O. Box 9632, Coral Springs, FL 33075; Randy Witte, (954) 474-5934 or Rick Schwartz, (954) 344-1983



Fiesta 1/8 Scale Gas Oval/Road Course Circuit, 1137 Candlewood Circle, Pensacola, FL 32514; Tom Simmon, (904) 477-6419



First Coast Speedway, 6410 Walther Dr., Jacksonville, FL 32211; Bob Thompson, (904) 743-2161



5-Fifty-5 R/C Raceway, State Road 555, Bartow, FL 33830; Chuck Nolke, (941) 324-7406



Frontier Race Track, 15260 N.E. 244th Ave., Salt Springs, FL 32134; Harold Reel and Don Combee, (352) 685-2881



Gainesville R/C Speedway, PO Box 693, Melrose, FL 32666; 130 NW 14th Ave., Gainesville, FL 32601; (352) 495-3600



Greater Orlando Auto Racers, 970 Keller Rd., Altamonte Springs, FL 32714; Dave Mottin



Hobby World Raceway, 7273 103rd St., Jacksonville, FL; Ray or Greg, (904) 772-9022



The Hobby Stop Raceway, 5609 Manatee Ave. W., Bradenton, FL 34209; Rich Konnen (941) 798-9638



Hudson's R/C Raceway, 590 Madeore St., St. Decembre, FL 32095; Steve Hudson, (904) 826-4050



Louie Burton's R/C Raceway, 4215 Mustang Rd., Lakeland, FL 33803; Louie Burton, (813) 665-1322



Miami R/C Raceway, 12546 S.W. 88 St., Miami, FL



Morris Kohl's Raceway and Hobby Shop, 1202 W. Waters Ave., Tampa, FL 33604; Morris Kohl, (813) 931-1626



My Rose, 1695 W. Indiantown Rd., Jupiter, FL 33458; Mark Watson, (407) 744-3800



NORRA, 3300 Santa Barbara Blvd., Naples, FL 33999; Jerry Pecar, (941) 455-9065 or Mark Benfield, (941) 263-6861



Ocala Radio Control Car Club, 3500 SE 30th Terrace, Ocala, FL 34471; Steve Shook, (352) 694-5147



Paul's Stadium Raceway, 4511 W. Dr. M.L. King Jr. Blvd., Tampa, FL 33614; Paul Surette, (813) 872-8662



PBG R/C Motor Park, 6351 Barbara St., Palm Beach Gardens, FL 33418; Doug Gleason, (407) 743-9791 or Tim Case, (407) 627-2608



Pro Hobbies Speedway, 715 N. Lake Pleasant Rd., Apopka, FL 32712; (407) 886-4615



Port St. Lucie Racing, 3626 SW Rivera St., Port St. Lucie, FL 34953; Frank Spadavecchia, (407) 336-8711



Red's R/C Raceway and Hobbies, 1010 Creighton Rd., Pensacola, FL 32504; Linda Tili, (904) 479-2330



River City R/C Car Club, 9711 Sharing Cross Dr., Jacksonville, FL 32257; Bill Fraden, (904) 268-1948



Sarasota Flat Track, 4900 Fruitville Rd., Sarasota, FL 34232; Jim Wilson, (941) 371-3689



Southwest Florida R/C Raceway, 2425 Rivers Rd., Naples, FL 33964; Clyde Armstrong, (941) 455-1143



Superior Hobbies R/C Parking Lot Racing, 430 E. Hwy. 436, Suite #106, Casselberry, FL 32707; Robbie Michael, (407) 834-9299



Tallahassee R.C. Raceway, Tom Brown Park, Easterwood Dr., Tallahassee, FL 32311; Roland Costine, (904) 671-2814



Tampa Bay R/C Club, P.O. Box 10224, St. Petersburg, FL 33733; Dick Gillette, (813) 526-0744



Tampa Hobbytown R/C 4 Slot Car Raceway, 15702 N. Dale Mabry, Tampa, FL 33618; Max and Judy Rosenroth, (813) 968-7233



Winterset Raceway, US Rt. 27 South, Winterset Motel, Sebring, FL 33872; John Bisbee or Mac Myer, (941) 699-1140 or (941) 385-4448



GEORGIA

A&S Hobbies & Raceway, 3389 Cypress Mill Rd., Brunswick, GA 31520; Edward Davis, (912) 264-5489



Dalton Raceway, 2300 Chattanooga Rd., Dalton, GA 30720; (404) 226-6699



Echeconnee Superspeedway, 2149 Richardson Dr., Macon, GA 31206; Andy Thompson/Cliff Kline, (912) 788-8731



Hobby Town Raceway, 2301 Airport Thruway, Columbus, GA 31904; Frank Bastos, (706) 660-1793



Lake Mayer Raceway, 1430 Dale Dr., Savannah, GA 31406; Pat Rossiter, (912) 354-0098



The Racer's Edge, 1530 Hwy. 19 N., Thomaston, GA 30286; Roger or Mark Walls



Sandy Cross Speedway, Rt. 1, Box 1071, Hwy 51, Royston, GA 30662; Morris Phillips or Wayne Fowler, (706) 245-9573



SHILOH R/C Raceway, 6362 Shiloh Rd., Hahira, GA 31632; Doug Burnett, (912) 794-2507



Silver Wings Raceway, 5611 Riverdale Rd., College Park, GA 30349; M. Bradshaw, (770) 991-2225



Stinger RC Super Speedway, 3769 Maysville Rd., Commerce, GA 30529; Deric Sauls, (706) 335-5006 or (706) 335-9044



Sugar Bowl R/C Speedway, 5272 Nelson Brogdon Blvd., Sugar Hill, GA 30518; Shelley Bailey, (770) 945-6709



Valdosta Hobbies, 3998 Inner Perimeter Rd., Valdosta, GA 31602; Ron Hood, (912) 244-2101



HAWAII

Garden Isle R/C Racers, 5855 Ahakea St., Kapaa Kauai, HI 96746; Arnold Morales, (808) 823-0856



Kakaako Water Front Park Dragway, 98-029 Hekaha St., Alea Bay #32, HI 96701; James Inkyo, (808) 487-5155



Keeli Lagoon Park, Leeward Community College, Waiapahu, HI 96797; (808) 676-5486



Mauui R/C Racing Association, 430 Hookahi St., #13, Wailuku, HI 96793; Tritech R/C/Hobbies/Radio Control Association, (808) 244-0526



Radio Control Hawaii, 474 Kalanikoa St., S-104, Hilo, HI 96720; Glenn Shiroma, (808) 935-5629



Team PRC Racing Club, 176 Mamo St., Hilo, HI 96720; Charlie Kawamoto, (808) 935-3561



IDAHO

Capital Dirt Burners, 301 N. Bruce, Boise, ID 83712; Mike Ard, (208) 345-3906



River City Bandits, 4867 N. Yellowstone, Idaho Falls, ID; Chris Hummer, (208) 523-9846



Snake River R/C Raceway, 265 Highway 50, Hansen, ID 83334; Jim Tattersall, (208) 423-5122



ILLINOIS

AJ's Raceway & Hobby, 10211 Kestlinger Road, Dekalb, IL 60115; A.J. Schultz, (815) 756-2772



C&R Hobbies, 39 E. Jones, Milford, IL 60953; Ray Craighead, (815) 889-4073



Diehard R/C Raceway, 300 N. Main, Kewanee, IL 61443; Dick Jennings, (309) 852-3700



Hobby Town Raceway, 9346 Virginia Rd. Lake in the Hills, IL 60102; Mike Hollingsworth, (847) 458-1777



Leisure Hours R/C Raceway, 24121 W. Theodore, Bldg. 1, Plainfield, IL 60544; Scott Hill, (815) 439-1777 (track), (815) 439-1477 (shop)



Machesney Park, 1220 Shappert Dr., Machesney Park, IL 61115, (815) 282-1311



Marty's R/C Hobby, 1335 E. Broadway, Bradley, IL 60915; Gail or Marty, (815) 933-8441



Miley Motor Speedway, 1109 N. Bloomington St., Rte. 23, Streator, IL 61364; Doug, (815) 672-4212



Monee R/C Raceway, 26049 Ridgeland Ave., Monee, IL 60449; Roy or Roberta Moody, (708) 534-2422 (track), (708) 799-5597



Pontoon Raceway, 3670 St. Route 111 Granite City, IL 62040-4304; Pat or Skip, (618) 931-1206



Outlaw R/C Speedway, 1614 Broadway, Mattson, IL 61938; (217) 234-6229



R/C Workshop, 3100 S.W. Adams St., Peoria, IL 61605; Al Kretz, (309) 673-4860



Radio-Active Raceway, 751 N. Bolingbrook Dr., #15, Bolingbrook, IL 60440; Jim, (630) 759-7557



Rector's R/C Raceway, R.R. 3, Box 104, Albion, IL 62806; Tim Wolfe, (618) 842-9379 (M-F), (618) 446-3251 (Sun.)



Shiloh Eagles Superspeedway, 308 N. Virginia Ave., Belleville, IL 62220; (618) 277-6030



SIRCAR Raceway, 1200 N. Marion, Carbondale, IL 62901; (618) 549-5885



Skokie Speedway, 4880 W. Dempster, Skokie, IL 60077; Pete, (847) 674-7349



Stanton Hobby Shop, 4718 N. Milwaukee Chicago, IL 60630; Tim Copeland, (773) 283-6446



Valley Farms R/C Raceway, 706 Bypass 20, Cherry Valley, IL 61016; Dean or Debbie, (815) 332-4516 or (815) 547-5984



Wep Speedway, R.R. #2, Box 44 Lawrenceville, IL 62439; Bill Poe



INDIANA

Bremen Racing Ent., 308 N. Bowen, Bremen, IN 46505; Dale Heuberger, (219) 546-3807



Dirt Slinger's Raceway, 546 North 12th Ave., Beech Grove, IN 46107; Phil Riley, (317) 787-3815



Elliott's R/C Raceway, 2140 North Plate, Kokomo, IN 46901; (317) 452-0163



G.R.C.C.C. Inc., 1651 W. Franklin St., Elkhart, IN 46516; Pete Russell, (219) 293-1827



Hardesty R/C Raceway, 11 East Plymouth St., Hamlet, IN 46533; Max Hardesty, (219) 867-8600



Hobby Barn Raceway, 1950 Springhill, Terre Haute, IN 47802-9694; (812) 299-5773



Hobbytown U.S.A., 5385 E. 82nd St., Indianapolis, IN 46250; Bill Scott (317) 845-4106



K&L Hobbies & Raceway, 3275 North 525W, LaPorte, IN 46350; (219) 324-0353



Kokomo Hobby & Radio Raceway, 1108 E. Markland, Kokomo, IN 46901; (317) 457-5060



P&T Hobbies and Raceway, RR 2 (Hwy. 60), Mitchell, IN 47446; Paul Weber or Tom Logsdon, (812) 849-6666, e-mail pntohobby@ix.netcom.com



Race Street Hobbies, 1126 1/2 Race St. New Castle, IN 47362; Jim Burke, (765) 521-4888



RC Barn, 310 N 125 W, Monroe, IN 46772; Mark Lengerich, (219) 692-6600



R.C.R.C. Raceway of Salina, 1300 E. Crawford, Bill Burke Park, Salina, KS 67401; Calvin Calp (913) 823-9588



R/C World of Indiana, 2264 West US Highway 36, Lynn, IN 47355; Joe Kolp (317) 874-2464





Rimfire Raceway and Hobby Shop, 8 Wood Ct., Hebron, IN 46341; Sandra Eaton, (219) 996-6288 (shop), 987-2803 (home)





The Rink, 7900 Whitcomb,


Track Directory


Pit Stop Hobbies, 106 A Street, Benton, KY 42025; Robert Fitzgerald, (502) 527-8216


ProTrak R/C Racing, 3451 Cane Run Rd., Louisville, KY 40211; Tony Hardin, (502) 778-2657



Rick's Hobby Farm, 2089 Park Rd., Hawesville, KY 42348; Rick Early, (502) 927-8527



Terry's R/C Hobbies, 691 Garner Ave., West Liberty, KY 41472; Terry McGuire, (606) 743-2126



Trio Hobbies & R/C, 216 Redmar Plaza, Radcliff, KY 40160; Maurice Johnson, (502) 951-7547



West Kentucky R/C Hobbies, 45 Hawkins Loop, P.O. Box 21, Symsonia, KY 42082; (502) 851-3534



LOUISIANA


Al's R/C Store, 1529 Anita, Sulphur, LA 70663; Al Gaspard, (318) 625-5880 or (318) 437-8545


Baton Rouge Velodrome, 7122 Perkins Rd., Baton Rouge, LA 70815; Weldon Sharon, (504) 665-5616; open Sunday 10-4



Cajun R/C Raceway, 728 Perry Lane, Opel, LA 70570; (504) 948-6350



Indy Speedway & Hobby, 3753 General DeGaulle Dr., New Orleans, LA 70131; Vince Sheetz, (504) 367-1891


Pontchartrain Hobby Shop, 3755 Pontchartrain Dr., Slidell, LA 70458; (504) 649-1199


Red River R/C Racers, 3203 Old Shed, Bossier City, LA 71111; David Gray, (318) 747-1863



MAINE


Clay Bowl R/C Hobbies, P.O. Box 61, Greene, ME 04236; Pat Cap, (207) 946-5003


R/C Speedway & Hobbies, 87 Main St., Fairfield, ME 04963; David Prescott, (207) 453-4588



MARYLAND

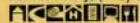
Cockeysville Astrodome Racers, 10854 York Rd. (rear), Cockeysville, MD 21030; Steve Balaz, (410) 666-2521



Doug's Raceway, 2935 Crain Hwy., Waldorf, MD 20601; Doug Moran, Jr., (301) 843-6220


Dusty Downs, 4665 Bethlehem Rd., Preston, MD 21655; Frank Show, (410) 673-2191


Hobby Town USA, 8223-11 Elliot Rd., Easton, MD 21601; Bill Dyke, (410) 820-9308



J.R.'s Race Place, 2935 Crain Hwy., Waldorf, MD 20601; James Radford, (410) 947-2766



Outback R/C Race Club, Maiden La., Manchester, MD 21102; Randy or Bonnie Henry, (410) 848-4350


The Track, 16806 Oakmont Ave., Gaithersburg, MD 20877; Mimi Wong, (301) 417-9630



MASSACHUSETTS

C&C Hobby & Raceway, 562 Russells Mills Rd., So. Dartmouth, MA 02748; Charlie, (508) 997-4131


Hi-Tech Hobbies, 1681 Broadway (Rt. 138), Raynham, MA 02767; Ruben, (508) 880-5373


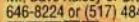
Megadrome Raceway, Rt. 8 Curran Hwy., North Adams, MA 01247; Bob Blanchette, (413) 743-7223


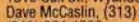
New England R/C Headquarters, 33 Fr. Devalles Blvd., Fall River, MA 02721; Chuck Gregory, (508) 673-6069



West Street Hobbies, 114C Main St., Medway, MA 02053; Jim, (508) 533-1231


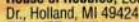
MICHIGAN

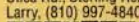
Akright Outback Racing, 984 Zimmer Rd., Williamston, MI 48895; Steve Akright, (517) 655-4531


Capital Area Racing Society, The Plumbers Hall, 5405 S. Logan, Lansing, MI; Dave Halsey or Brad Smith, (517) 646-8224 or (517) 484-4028


Down River R/C Association/Riders, 1519 Oak St., Wyandotte, MI 48192; Dave McCaslin, (313) 287-7405 or (313) 284-1560


Freedom Hill R/C Raceway, 29330 Coolidge, Roseville, MI 48066; Curley Grewe, (810) 776-5483


House of Hobbies, 2863 West Shore Dr., Holland, MI 49424; (616) 786-3686



Larry's Performance R/C's, 43665 Utica Rd., Sterling Heights, MI 48310; Larry, (810) 997-4840


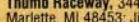
MCRC Raceway, 4601 Page Ave., Michigan Center, MI 49203; Sam Sprang, (517) 787-9161



N.W. Michigan R/C Club, 744 Munson Ave., Traverse City, MI 49686; Jim Ovaatt, (616) 947-6670


Newberry R/C Raceway, RR 3 Box 2880, McMillan, MI 49653; Dustin Hart, (906) 293-3044



R&L Hobbies & Racing, 9782 Portage Rd., Portage, MI 49002; Rex Simpson, (616) 323-3686; fax (616) 329-1744



Rodgers R/C Raceway, 7463 Ridge Rd., Britton, MI 49229; George Rodgers, (517) 451-8301


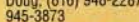
Thumb Raceway, 3441 Main St., Marlette, MI 48453; Jim Wilson, (517) 635-7848


USA Raceways, 6083 Dixie Hwy., Bridgeport, MI 48722; Dave Killingsworth, (517) 777-7054


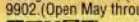
Vicksburg Off-Road R/C Raceway, 50201 Silver St., Vicksburg, MI 49097; Jeff Schroeder, (616) 375-8591



Village Hobbies-n-Crafts, 195 N. Elm, Hesperia, MI 49421; Alan or Fran, (616) 854-1374


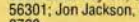
West Michigan R/C Racers Club, 814 E. Railroad St., Hastings, MI 49058; Doug, (616) 948-2287 or Pat, (616) 945-3873


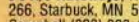
Westside R/C Raceway, 4335 Lake Michigan Dr., Grand Rapids, MI 49504; George Oriukowski, (616) 791-9902; (Open May through December)


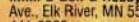
MINNESOTA

Duey's Hobbies & R/C Raceway, 6600 Cahill Ave., Inver Grove Heights, MN 55076; Duey Carlson, (612) 450-1721


Grand Rapids R/C Speedway, 2209 Hwy 2 East, Grand Rapids, MN 55744; Aaron Voges, (218) 326-6751


Greater Minnesota Racers' Place, 3302 Southway Dr., St. Cloud, MN 56301; Jon Jackson, (320) 252-9768


J's R/C Raceways, Rte. 2, Box 266, Starbuck, MN 56381; Jay Campbell, (320) 239-4827


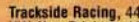
Minn-E-Golf & Hobby, 9100 Park Ave., Elk River, MN 55330; (612) 441-8365


Paul Bunyan Raceway, Rte. 1, Box 468, Bemidji, MN 56664; Brad Trask, (218) 243-2749


Ray's Raceway Park, 105 3rd Ave. NE, Glenwood, MN 56334; Dan Winter, (320) 634-5246



R/C Racing World, 235 Main Ave. North, Harmony, MN 55939; Mark McKay, (507) 886-5931 or (507) 886-2224



Southside Speedway, 2241 Marion Rd. SE, Rochester, MN 55904; Kevin Guy, (507) 281-3233



Trackside Racing, 443 8th Ave. NW, New Brighton, MN 55112; Winton Otelle, (612) 633-2112


Wild West R/C Speedway, 2822 Piedmont Ave., Duluth, MN 55811; Roger Deloach, (218) 727-6248



MISSISSIPPI

Fast Freddy's Raceway, 20390 Hwy. 49, Saucier, MS 39574; Mark Payne, (601) 832-0315


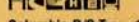
Joe McFadden Hobbies, 1619 51st Ave., Meridian, MS 39307; Joe McFadden, (601) 483-7000



Small Cars Unlimited, 820 Cooper Rd., Jackson, MS 39212; (601) 372-FAST


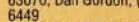
MISSOURI

All Seasons Hobby, 152 O'Fallon Plaza, O'Fallon, MO 63366; Bob Daniels, (314) 281-8767


B&L Hobbies & Raceway, 2800 Anchor Dr., Park Hills, MO 63061; Bob Marler, (573) 431-9444


Blue Vue Speedway, 12019 E. 47th St., Kansas City, MO 64133; Mark Randol, (816) 358-0238


Columbia R/C Trax, 1502 W. Bus Loop 70 (Exit 125), Columbia, MO 65202; Gary Phillippe, (573) 682-3993


Fire Mountain Raceway, 8647 Commercial Blvd., Pevely, MO 63070; Dan Gordon, (314) 475-6449


Greentree R/C Racepark, St. Louis Dirt Burners R/C Club, Marshall Rd., Kirkwood, MO; (314) 831-2194


Ozark Mountain Speedway, Rt. #2 Box 50, H-Highway and County Rd. 31, Noel, MO 64854; Clayton Younker, (417) 475-6222

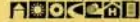

Ozarks R/C Raceway, Hwy 13, Brighton, MO 65781; Gene Rhodes or Ron Hawkins, (417) 742-4376 or (417) 742-2561


North Missouri Raceway, 223 Graves St., Chillicothe, MO; Billy Johnston, (816) 646-1120



RealBlue Vue Speedway, 24204 State Rt. 58, Pleasant Hill, MO 64080; Steve Hale, (816) 540-5584



Wilson's R.C. Speedway, 204 Southwest Dr., Kennett, MO 63857; Keith Wilson, (573) 888-9223



MONTANA


Stormer Raceway & Slot Motorplex, P.O. Box 126 Hwy 2 East, Glasgow, MT 59230; (406) 228-4569



NEBRASKA

Goodyear Superspeedway and Off-Road, 4021 North 56th, Lincoln, NE 68510; Tom or Bob, (402) 464-5000


Mr. Bill's, 450 West 2nd St., Hastings, NE 68901; Bill J. Ries, (402) 462-4865


O.N.R.O.A.D., 3307 N. 58 St., Omaha, NE 68104; Cook Jacobs, (402) 556-8674


Salvation Army South Corps, 4032 Harrison St., Omaha, NE 68164; James Frye, (402) 734-3414; fax (402) 734-3415



Winners' Circle, 3368 N. 88th Plaza, Omaha, NE 68164; Robert Conner, (402) 571-1821


NEVADA


Dansey's Indoor R/C & Hobbies, 741 N. Nellis, Las Vegas, NV, David Lugo, (702) 453-RACE



Western R/C Raceway, 6404 Richmar, Las Vegas, NV 89139; Randy Grigg, (702) 260-9222

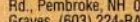

NEW HAMPSHIRE

Axis Racing R/C Dragway, 4197 High St., Hampton, NH; Dan Peterson, (603) 926-5211



Economy R/C Speedway, 4 Maple St., Winchester, NH 03470; Harold Thomas, (603) 239-4482 or 239-6470

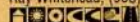

Open Season Sports Center, Rt. 302, Lisbon Rd., Lisbon, NH 03585; Joseph Wiggott, (603) 838-6602



Robert's Railroad & Hobbies, 1335 1st NH Turnpike—Rt. 4, Northwood, NH 03261; Robert M. Jeffers, Jr., (603) 942-7659


RT 106 Racepark, 743 Clough Mill Rd., Pembroke, NH 03275; Douglas Graves, (603) 224-RACE



NEW JERSEY


America's Hobby Center Inc., 18300 Tonnelle Ave., North Bergen, NJ 07047; John Many, (201) 662-0777



Ray's American Raceway, 142 Wilson Ave., Englishtown, NJ 07726; Ray Whitehead, (908) 446-3737


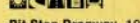
Family Hobbies Raceway, 3576 N.W. Blvd. & Weymouth Rd., Vineland, NJ 08360; Linda Vogel, (609) 696-5790



Golden Hobbies Raceway, 415 Erial Rd., Pine Hill, NJ 08021; John or Iona Golden, (609) 782-1222



Jefferson Speedway, 5494 Berkshire Valley Rd., Oak Ridge, NJ 07438; (201) 697-7525


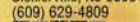
Jerry's Hobby Center & Raceway, 336 Rt. 22W, Greenbrook, NJ 08812; Jerry or Gary, (908) 752-6030


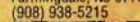
LBRA Track, 392 Warburton Pl., Long Branch, NJ 07740; (908) 222-5122


Millville R/C Oval, 114 N. High St., Millville, NJ 08332; William Denstoz, (609) 327-4640


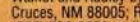
Pit Stop Dragway, 100 Campus Rd., Totowa, NJ 07512; Kimberly Frank, (201) 956-7223


On Trax Hobbies, 1549 Rte. 70, Browns Mills, NJ 08015; Joseph DiGirolamo, (609) 735-0422


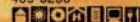
South Jersey Cost Controlled Racing, 25 Jackson Lane, Sicklerville, NJ 08081; Ray Murray, (609) 629-4809


The Race Place, 1151 Hwy. 33, Farmingdale, NJ 07731; John Fary, (908) 938-5215


NEW MEXICO


Meerscheidt R/C Raceway Park, Meerscheidt Recreation Center, Walnut and Hadley by BMX, Las Cruces, NM 88005; Robert Heinsen, (505) 526-6856 or Jim Meerscheidt, (505) 523-2995; email MEERSCH@aol.com


NEW YORK

BarnStormers, MD #1 Old Oxford Rd., Chester, NY 10918; Lou, (914) 469-8206


Beach Hill Speedway, 1760 Beach Hill Rd., Watkins Glen, NY 14891; Jim Riley, (607) 535-2616


Brian's Off-Road Track, 1124 N. Forest, Williamsville, NY 14221; Brian Was, (716) 633-8155


Brookport Speedway, 6000 Sweden Walker Rd., Brookport, NY 14420; Gil & Betty Glidden, (716) 637-6224



Brownie's Pro & Sport Hobbies, 124 Bennett St., Staten Island, NY 10302-1426; John Brown, (718) 727-2194



BSK Hobbies & Raceway, 120 Main St., H

Track Directory


Rampage R/C, 27 Fuller Lane, Hyde Park, NY 12538; Brian Walker, (914) 229-1379; (914) 229-2456



R/C Competition Corner, 2413 Brewerton Rd., Mattydale, NY 13211; Lori and Cos Cirriello, (315) 455-8718


R/C Sport Hobby, 69-57 Jumper Blvd. South, Middle Village, NY 11379



R&S Hobbies, 356 Macedon Ct. Rd., Fairport, NY 14502; (716) 425-3722



Ringwood Junction, 1922 Dryden Rd., Freeville, NY 13068; Steve Miller, (607) 347-4198


Schoharie Co. R/C Car Club, P.O. Box 126, Cobleskill, NY 12043; (518) 922-6982


Southern Tier Raceway, 88 Paige St., Owego, NY 13827; Anita Harding, (607) 687-5395


South Shore Hobby & Raceway, W. Roe Blvd., Patchogue, NY 11772; Don Hauck, (516) 758-5567


Speedworld R/C & Hobby, P.O. Box 482, Chenango Bridge, NY 13745; Michael Magnusson, (607) 648-2063



Tri County Remote Control Car Club, 33 West Decker St., Johnstown, NY 12095; Jim Sprouse, (518) 762-8884


Tri-state Area Radio Control Model Auto Club (TARMAC), 28/30 Mountain View Rd., Poughkeepsie, NY 12603; Todd (914) 342-5409; tracksite (914) 454-8276



Walt's Hobby, 2 Dwight Park Dr., Syracuse, NY 13209; (315) 453-2291


Westfield R.C. Speedway, 27 Clark St., Westfield, NY 14787; John or Jared Lindstrom, (716) 326-2339


Whitestone, 30-56 Whitestone Expy. (Dept. of Motor Vehicles), Flushing, NY 11374; Rudolf Ardiella, (718) 966-6155


ZOAR Road Speedway, 15318 Armes Ct., Gowanda, NY 14070; David & Gordon Ackler, (716) 532-9463


NORTH CAROLINA


A&J R/C Models, 2051 Anthony Rd., Burlington, NC 27215; Jerry Loye or Andrea Thompson, (910) 227-4556; fax (910) 227-1001


Another Zito's Mobile MASCARR Inc., 412 E. Blume St., Landis, NC 28088; Carmen Esposito or Pat Youngerman, (704) 451-3293


The Antique Barn, 2810 Forest Hills Rd., Wilson, NC 27893; Steve Seidinger, (919) 237-6778



Atlantic Coast R.C., 8-A Lockhead Ct., Greensboro, NC 27409; Charlie Higgins or Harry Johnson (910) 664-1277


Badin Shore Raceway, 1730 Jackson Lake Rd., High Point, NC 27263; Jimmy or Tim Martin, fax (910) 431-6407


C/C Hobby Speedway, 8358 U.S. Hwy. 220 Bus. N., Randleman, NC 27317; Steve & Mary Cox, (910) 495-3482


C&H Raceway, 1400 N. Cannon Blvd., Kannapolis, NC 28083; Camera & Hobby Shop, (704) 933-5321



Cape Fear Speedway, 207 Harley Rd., Wilmington, NC 28401; Bob Justice, (910) 452-2354


Carolina Dragway, 907-D Warsaw Rd., Clinton, NC 28328; (910) 592-4569



Hobby Club R/C Raceway, 1241 Buck Jones Rd., Raleigh, NC 27606; Hobby Club, (919) 460-8838



King R/C & Super Speedway, 143 Industrial Dr., P.O. Box 897, King, NC 27021; Chris Smith, (910) 983-5598 or (910) 883-3969



Ride & Slide R/C Raceway, 5319 Yaddin Rd., Fayetteville, NC 28303; Jim Woodman (910) 425-5276 or Bill Culbertson (910) 867-4202


R&J Off-Road Racing, 6172 Blalock Rd., Lucama, NC 27851; Robert Williams, (919) 239-0853 or Jonathan Jenkins, (919) 746-2703



Radio Jockey's Parkway, "R.J.'s," Rt. 9, Box 651, Fay, NC 28301; Tony Starling, (910) 486-4820



Rosewood R/C Speedway, 651 Community Dr., Goldsboro, NC 27530; Glenn Elam, (919) 731-4734



Southern RC Motorsports Club, Hwy. 17S, Shallotte, NC 28459, P.O. Box 1651; Mark Whitt, (910) 754-4902 or Eddie Ferster (910) 754-8528


Ultratrax, 5505 Palmers Branch, Leland, NC 28451; Mike Williams, (910) 313-0350



NORTH DAKOTA


Hacienda Hills Speedway, 20 Hacienda Hills, Minot, ND 58701; Kenny Duchscherer, (701) 839-4419



Northern Mini Racers, P.O. Box 415, Minot, ND 58702; Roger Lee, (701) 839-5294


Surrey International Raceway, RR 1, Box 37, Norwich, ND 58768; Marlen Lenton, (701) 728-6760



OHIO


Aerotech Raceway, 409 Applegate Rd., North Canton, OH 44720; (330) 499-1300



Canton R/C Raceway, 2206 13th St. NE, Canton, OH 44705; Dan Mauger, (330) 833-3091


Classic Hobbies, 1994 E. Waterloo Rd., Akron, OH 44312; Walt Ellis, (216) 733-6400



C/R Hobbies and Raceway, 323 Center St., Ashtabula, OH 44004; Virginia Gagat, (330) 992-3833



CORCAR/Sams Club, 128 Amity Rd., Galloway, OH 43119-8732; Bill Stevenson, (614) 870-7159


Columbus R/C Racing Club (C.R.C.R.C.), Franklin County Fairgrounds, Hilliard, OH 43026; Jeff Crowell, (614) 236-1783


D&D Hobby Center, 1344 Lexington Ave., Mansfield, OH 44907; Eric Radio (419) 756-9771


D&J R/C Raceway, 801 W. Market St., Orrville, OH 44667; Don Yoder or Mark Nussbaum, (330) 682-4265



Flag City Raceway, 3772 C.R. 18, Findlay, OH 45840; Ruth Hubbard, (419) 422-5589


Fun for All Raceway, 675 College Dr., Batavia, OH 45103; Steve Donaldson, (513) 732-0440


Greentown R/C Raceway, 3353 Perrydale, Greentown, OH 44630; Chuck Lambert, (330) 364-6585


Hobby World, 3499 SR 59, Ravenna, OH 44266; Tom Fry, fax (330) 296-0894



Lafferty R/C Raceway, Box 153, 70228 Hurrah St., Lafferty, OH 43951; Chris Christman, (614) 968-4818


Lakes Hobbies, 3425 Manchester Rd., Akron, OH 44314; Roy Spencer, (330) 645-6912


Medina R/C Raceway, 754 N. Court St., Medina, OH 44256; Bill Ahoit, (216) 723-0255



Mid American Raceway, 13150 Airport Hwy., Swanton, OH 43558; Bill or Chuck, (419) 475-9459



Mr. T's R/C Super Speedway, 5540 CR 16, Wauseon, OH 43567; Nick Tinsler, (419) 335-3196


Performance R/C Club of Ohio, 2206 13th St. NE, Canton, OH 44705; Greg Ledbetter, (216) 453-7089


Scotter's Hobby Hut, 234 Robbins Ave., #D, Miles, OH 44446; Dave "Scooter" Evans, (216) 544-9411


TARCAR, 7216 Nebraska Ave., Toledo, OH 43617; Bill Bridges, (419) 826-3859


Tri-State R/C Auto Racers, Joyce Park, Hamilton, OH, Ernie Bauhoffer, (513) 528-2052



Van Wert R/C Raceway, 144 E. Main St. (above Hoverman Music), Van Wert, OH 45891; Mark Davis, (419) 232-2112



Y-City Hobby & Speedway, 120 S. 6th St., Zanesville, OH 43701; Kevin McKenna, (614) 455-3025


OKLAHOMA

Adams Creek R/C Speedway, 5207 S. 194th E. Ave., Broken Arrow, OK 74014; John Beighle, (918) 355-1416


Competition R/C, 100 SE 89th, Oklahoma City, OK 73149; James or Louise Brown, (405) 634-0809


Coweta Hobby & Speedway, 310 S. Broadway, Coweta, OK 74429; Derial Seabolt, (918) 486-3948



R/C Speedway, 1401 N. Vanburan, Enid, OK 73701; Sean or Jessica Hillery, (405) 237-5504



Remote Control Race Course, 400 S. Vermont Ave., Suite 104, Oklahoma City, OK 73108; Rick or Steve, (405) 947-RACE


Wild Country Speedway, 127 South Main, Porter, OK 74454; Charles McColough, (918) 685-0372 or (918) 687-1686


OREGON


Competition Racing Association, 17941 SE 38th Ave., Portland, OR 97236; Jody (503) 751-1334


Junior Vehicle Speedways, 3090 Starwood Ct., Medford, OR 97501; (541) 779-3090


Pit Stop Hobby, 634 N. Coast Hwy., Newport, OR 97365; Richard Wood, (541) 265-2825



R/C Craze Speedway, 300 Ashland Lane, Ashland, OR 97520; Shawn Lazareff, (541) 482-4786



R/C Plus Hobbies Raceway, 1857 25th St. SE, Salem, OR 97302; Ron Smith, (503) 364-9188



R/C Speed Center, 2810 N. Pacific Hwy., Medford, OR 97501; Gene and Betty Jean Skelton, (541) 779-8298



Yamhill County R/C Car Club, 722 Morgan Ln., McMinnville, OR 97128; Larry Rucker, (503) 472-7234



PENNSYLVANIA

A&D's Bumps & Jumps, RR7, Box 7395C, Stroudsburg, PA 18360; Dan Ambrosio, (717) 424-1750



A&E Raceway, Latrobe 30 Plz., Latrobe, PA 15650; Bruce Parker, (412) 539-7130


Bachman's Speedway & Hobbies, Box 306, Effort, PA 18330-0306; Jeffrey Bachman, (610) 681-5845



Benders Junction Speedway, 2300 Benders Dr., Bath, PA 18014; Gerald Wambold Jr., (610) 759-0161



Brookville Hobby Shop, 170 Main St., Brookville, PA 15825; Mark Tonell, (814) 849-7385



CEB Motors R/C Div., 5743 Molly Pitcher Hwy., Marion, PA 17235; Charlie Booz, (717) 375-4635


Clearfield R/C Raceway, PO Box 297, Hyde, PA 16830; Joe Welch, (814) 765-3045



Columbia Racing Association, 128 N. Front St., Phillipsburg, PA 16866; Lurch Hammal, (814) 342-7114



Cressona Mall Speedway, Rt. 61, Pottsville, PA 17901; (717) 385-3506


DC Ultra Trax, 13 York Rd., Wycombe, PA 18974; David Cowan, (215) 672-5200



Dreamboat Hobbies, 2810 Pennsylvania Ave. W., Warren, PA 16365; Louie Dussia, (814) 723-8052


East St. Raceway, 736 E. Railroad Ave., Verona, PA 15147; (412) 826-0602


Fantasy RC's and Hobby, 2315 W. 12th St., Erie, PA 16505; Frank Francis, (814) 453-6337


Hipkin's Hobbies, 402 W. Avondale Rd., West Grove, PA 19390; Doug, (610) 869-8585



Hobby America Raceway, 5 Fitzsimmons St., Duke Center, PA 16729; Dan or Mike Coast, (814) 966-3765



Koontz's Home & Hobby Center, 1205 Hoover St., Pittsburgh, PA 15204; (412) 331-3866



Kranzel's R/C Raceway & Hobbies, 415-B Bosler Ave., Lemoyne, PA 17043; David or Stuart Kranzel, (717) 737-7223



Little Plum R/C Hobbies, RR 1 Box 330, Lock Haven, PA 17745; Larry Duck, (717) 769-1984


Lug Nut Raceway, Rt. 309 at Hartman Rd., Montgomeryville, PA 18936; Kathy Anderson, (215) 822-5831


Marshall's R/C Raceway, RR 4, Box 640, Honesdale, PA 18431; Bill or Dot Marshall, (717) 729-7458


The Mushroom Bowl, 960 W. Cypress St., Kennett Square, PA 19348; Bruce or Drew, (610) 444-1850


Pinion Twisters, 3M Plant, Green Ln. and Mitchell, Bristol, PA; Mark, (215) 632-2344 or Tony (215) 742-3560



Pit Stop Hobbies, 262 W. Main St., Mount Joy, PA 17552; James Stoudt Jr., (717) 653-6222



Pro Challenge Raceways, Wycombe Ave. (P.O. Box 536), Lansdowne, PA 19050; Bob Paulavague and Don Fewkes, (610) 622-7651


Prop & Wheels Raceway, 139 W. Broad St., Tamaqua, PA 18252; Gil Walters, Prop & Wheels Hobbies, (717) 668-2288


RC Outfitters RCO Raceway 519 Broadway, Hanover, PA 17331; Chris Shaffer, (717) 833-9490


R/C Pro Speedway, Millville Rd., Bloomsburg, PA 17815; John Swisher, (717) 387-0266; fax (717) 387-4937


R/C Pro III, 910 Chestnut St., Coal Twp. (Shamokin), Shamokin, PA 17866; John Swisher, (717) 648-7763


Riverside Raceway, PA Ave. W & Hickory, Warren, PA 16365; Jeff, (814) 723-4211


Rolling Wheels R/C Raceway</

RACING TO BRING YOU THE BEST!

PROTOform[®]

Touring Car Trends



Calibra ITC—part no. 1409

If you live in America and you love cars and car racing, consider yourself extremely fortunate. The wide variety of American racing series seems to get bigger and better every year, whether it's NASCAR, SportsCar (IMSA), CART or NHRA. A couple of relatively new racing venues started last year and are now entering their sophomore season, the IRL (Imitating Racing Legends) and the NATCC (North American Touring Car Championships). The touring cars are definitely a lot of fun to watch and it's easy to see why the BTCC (British Touring Car Championships) are so popular in the UK and all over Europe. The American series has some work to do to catch up to the one in Britain but with continued factory support, such as that from Dodge, we will see some truly great racing entertainment in that series.

In the R/C world, we have also seen touring cars (sedans) continue to grow in popularity, as R/C manufacturers such as Tamiya and Yokomo have supplied us with some truly great chassis. Here at Protoform Race Bodies, we felt a bit like the NATCC racers as we strove to "catch up." We now offer six different bodies that fit the 180-190mm chassis. We firmly believe that the realistic

appearance and handling characteristics of the sedan class have accounted for much of its success as an R/C trend. In keeping with the "spirit" of the class, we made each body as realistic as possible. Recently, we started to include window masks with all our sedan bodies as well as the wings and mounting hardware. More recently, we have also started to include a sticker sheet (with grill, lights and other details) to make detailing your sedan bodies both easy and fun.

As part of our "catching up" process, we're also going to consider the needs of the serious racers who are primarily looking for bodies that enhance the handling and performance of their sedan chassis. Thus, we are pretty excited about the extremely "racey" sedan bodies currently in the works.

We want to congratulate Jason Varley for winning the BRCA Touring Car Nationals in England. Jason TQ'ed and won the first time he fitted a Protoform Calibra ITC body #1409 to his YR4M chassis. His Pro-Line tire-shod Calibra defeated World Champ David Spashett to earn the title. Well done, Jason!

In preparation for this summer's IFMAR Off-Road Worlds in Southern California, we have released a new buggy body (#1517) for the car that convincingly destroyed the competition at the Worlds Warm-up Race: the Associated B2. The new body is called the Protoform B2 "Blast."

Have fun this summer!

New and Hot Protoform Bodies

- 1215 1997 Monte Carlo HS (high speed/low drag) w/spoiler
- 1407 Peugeot 905B on-road body (wide) w/spill plates available in 3 versions—1407H (high downforce); 1407M (medium downforce); 1407L (low downforce)
- 1408 1997 Audi A4 (BTCC) touring car with 2 wings (180mm)
- 1409 1996 Opel Calibra ITC w/3 wings (190mm)
- 1410 1997 BMW 320i BTCC touring car w/2 wings (190mm)
- 1411 1997 Camaro (Trans Am Series) w/spoiler for Associated Dual Sport
- 1412 1997 Aurora (IMSA) w/wing for Associated Dual Sport
- 1413 1997 Volvo S40 BTCC touring car w/wings (190mm)
- 1413W Extended Height Sedan wing kit w/2 wings and hardware
- 1414 1997 Corvette C5 (FIA GT series) w/wings (190mm)
- 1512 1997 Ram off-road truck for RC10GT (fits wide shock towers)
- 1513 Ripper Double-X 'CR' buggy w/wing for Losi Double-X 'CR'
- 1514 1997 Chevy C-1500 off-road truck for Associated RC10T2 & RC10T
- 1515 "Scorchers" 1/8-scale gas body fits Kyosho Inferno MP-5
- 1516 "Sidewinder" off-road truck fits Losi GTX gas truck
- 1517 B2 "Blast" buggy for Associated RC10B2 w/wing

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The Grove Racing Center, 939 S. Anderson Rd., Rockhill, SC 29730; Mike Durham or Don Faris, (803) 327-4121

Hobbies and More, 1570 S. Main St., Darlington, SC 29532; Jerry Pollard, (803) 393-0355

J&M R/C Hobbies, 5341 Dorchester Rd., Evanston Plaza, N. Charleston, SC 29418; Mike Smith, (803) 552-9449

ORA Atomic Racing Facility, 373 Boyd Pond Rd., Aiken, SC 29803; Bill Jackson, (706) 855-0846 or (803) 642-0314

World Hobbies, 707 Sulphur Springs Rd., Greenville, SC 29617; Bob Pittman, (864) 246-4702 (Closed after 4:00 pm Mondays)

SOUTH DAKOTA

Action R/C Raceway, 107 N. Main, Mitchell, SD 57301; (605) 996-6895

Boomerangs Raceway, 105 N. Main, Hartford, SD 57033; Ed Smithback, (605) 528-7345

Dakota Off-Road Racers, 2989 W. Br. Co. 12, Aberdeen, SD 57401; (605) 226-0604

Goldtrax Raceway, 409 E. High, Lead, SD 57754; Steve Brown, (605) 584-2355

R/C Action Raceway, SE Corner at 484th & Hwy. 38, Sioux Falls, SD 57105; Brian Cox, (605) 373-0511

TENNESSEE

Beaver Dam Racing, 7408 Royal Springs Knoxville, TN 37918; Ed Bardill, Tennessee Association of R/C Auto Racing, (423) 922-4309

D&M's Downtown Raceway, 2703 U.S. Hwy. 411S, Maryville, TN 37303; (423) 681-8919

Lawson Raceway, 152 Joel Rd., Oliver Springs, TN 37840; Anthony Lawson, (206) 815-0379

Machine-Head Straits, 938 Grandmere Rd., Lawrenceburg, TN 38464; Larry and Elaine Sanders, (615) 762-6630

MSA R/C Racing, Rt. 12 Box 489 B, Crossville, TN 38555; D.R. Findley, (615) 456-0027

Sparta Raceway Park, 32 N. Main St., Sparta, TN 38583; Carl (Buddy) Elrod, Rt. 5 Box #652, Sparta, TN 38583; (615) 836-8450 or (615) 761-3407

TEXAS

AA Raceway, 1617 Foomey Rd., Big Mike's R/C Raceway, 1405 W. Cotton St. (behind the Locker Room), Longview, TX 75604; (903) 297-7814

Eastex Raceway, 45000 Hwy. 59 N., New Caney, TX 77357; Brent Mahaffy, (713) 399-9777

Fastrack Raceway, 301 Edith Drive, El Paso, TX 79924; Hector Gonzalez, fax, (915) 779-4524

Flip & Spin R/C, 5957 Jones Rd., Bryan, TX 77807; Garland Crabb, (409) 822-7311

Hal's Hobby Raceway, 1440 Bessemer, El Paso, TX 79936; (915) 591-2213

The Hobby Center Raceway, 4104 Stan Schlueter Loop, Suite 1, Killeen, TX 76543; Lawrence Remick, (817) 690-7311

Hobbycraft Speedway, 819 N. Main St., Corsicana, TX 75110; Keith Hoffman, (903) 872-6761

Hobbytown USA, 7676 FM 1960 W., Houston, TX 77070; Fred Pfafman, (713) 955-7097

Hobbytown USA, 999 E. Basse Rd., Suite 177, San Antonio, TX 78209; Joe Sena or Clark Baisdon, (210) 829-8697; fax (210) 829-8707

Indy R/C World, 220 Saturn Rd., Garland, TX 75041; Steve Webster, (214) 271-4844; fax (214) 271-4502

Keyser's Hobbies, 1643 Texas, College Station, TX 77840; Bill Bennett, (409) 693-8095

MBRC Off-Road Raceway, 1000 Oak Grove Rd., Fort Worth, TX 76115; (817) 429-0985

North Houston Speedway, 11847 Spears Rd., Houston, TX 77067; Bob or Carol Hillin, (713) 872-2471

North Texas 1/12 Scale Association, 3905 Sandia, Plano, TX 75023; Dean Densmore, (972) 519-0324

Performance Raceway, 1106C Witte Rd., Houston, TX 77055; Jorge Tabush or Terry Schmid, (713) 464-4458

Rick's R/C Raceway, 238 Scenic Loop, Boerne, TX 78000; Rick, (210) 981-2245 or Rich (210) 590-1805

Rough Country, 905 Jacksboro Hwy., Wichita Falls, TX 76301-5310; Robert Kerr, (817) 322-2453

Star/Car Raceway, 5802 Patton St., Corpus Christi, TX 78415; Glen Stead, (512) 949-8525; Race Hotline, (512) 881-6105

T&T Eagle, 161 W. Spring Creek Pkwy., #601, Plano, TX 75023; Tony Welborn, (214) 517-0562

Texas Speedway, 6707 Chimney Rock, Bellaire, TX 77401

Tiger's Den R/C Speedway, 702 E. Broad St., Mansfield (DFW), TX 76063; Bob Burns, (817) 477-5513

T.O. Offroad Raceway, 6236 Quail, El Paso, TX 79924; Efrén Saenz, (915) 821-7522

Triple Jays R/C Raceway, Route 4, Box 720, Allen, TX 75002; Jeffrey Jay Johnson, (972) 562-7967

Wild Bill's Raceway, 535 E. Shady Grove, Irving, TX 75060; Lynn Morgan or Tom Nix, (214) 438-9224

UTAH

Intermountain R/C Raceway, 8481 W. 2700 S., Magna, UT 84044; David Mott, (801) 250-8303

Payson R/C Raceway, 955 South Main, Payson, UT 84651; Gus Wood, (801) 224-3852 and Lasca Wood (801) 222-8677

WOR Raceway, 3170 Brinker Ave., Ogden, UT 84401; Brian Worton, (801) 393-2530

VERMONT

Barre Town R/C club, 14 South Main St., Wall St. Complex, Barre, VT 05641; Russ Tribble or Pete Perreault, (802) 888-2860 or (802) 476-9458

Bradford R/C Racing, Main St., Bradford, VT 05033; Seth Bean, (802) 222-9674

Stoughton Pond Raceway, Stoughton Pond Rd., Perkinsville, VT 05151; Rick Adams, (802) 263-9321

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"The Driving Force"

The annual Cleveland Indoor Championships was one of the most memorable events of 1996. Team Trinity/Jaco driver Joel Johnson wowed the crowd with his seventh 4-cell modified championship win. Joel led the field of 10 Pro-Line/Jaco drivers to victory on Purple fronts (2325) and Grey rears (2345). In fact, Pro-Line/Jaco tires won every class at this prestigious event:

Chuck Lonegran—winner Masters Class
Mike Dumas—winner Stock class
Frank Calandra—winner F-1 Class

The K&N Winter Blast was the first major event of the 1997 season. All the factory teams gathered at this race to claim bragging rights and hopefully start off the new year on a winning note. Team Pro-Line/Jaco's Frank Polimeda must have made winning races his New Year's resolution as he promptly TQ'ed 1/10- and 1/12-scale modified setting new track records in each class. Frank then went on to win 1/10 modified. Pro-Line/Jaco carpet aces Steve Fiume and Tom Barnhart won 1/12 modified and 1/10 stock respectively.

Pro-Line/Jaco picked the Snowbird Classic at the Thunder Raceway in Tampa, FL as the official debut of their much anticipated capped tire. Well, they were certainly worth the wait! Team Pro-Line/Jaco driver Frank Polimeda went out on his first qualifying run and promptly destroyed the track record by almost two laps. Needless to say, Frank was top qualifier as his 56-lap effort was the fastest run ever recorded at this track. He then proved this awesome performance was no fluke by dominating the 600-lap Enduro. Frank led almost every lap from start to finish, victorious by 9 laps over the nearest competitor. Frank used Green left front (2911), Green narrow rear (2914), Orange standard front (2932) and Orange standard wide rear (2936) tires.

NORRCA held its first super speedway event of 1997 at the Dominguez Hills Velodrome. This was the perfect opportunity for Pro-Line/Jaco to debut our new "V-rated" tires. Designed specifically for high speed velodromes, the V-rated tires use a very low rolling resistance racing rubber bonded to a lightweight inner core. A special thick-mil belt prevents the tire from expanding during high speed runs. How do they work? Well, Frank Killam TQ'ed, won and set a new track record in 1/10 modified. Derek Pough then proved the durability of the V-rated design by TQ'ing, winning and setting a new track record in the enduro. It's getting increasingly harder to stop "The Driving Force," Pro-Line/Jaco!

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23111; Bob, (804) 746-2758

Brown Brothers Hobbies, 924 North
Main Street, Dumfries, VA 22026;
Joel or Bob Brown, (703) 221-5746

Cooper's R/C Race Center, 4000
Sage Rd., (969), Chatham, VA 24531;
Norris Cooper, (804) 724-7342 or
(804) 724-4182

Fairstone R/C Speedway, Rt. 4, Box
918, SR635 Goblintown, Stuart, VA
24171; Pat Moon Jr., (540) 930-3984

Gloucester Scale Hobbies, 2352
George Washington Memorial
Highway, Hayes Plaza, Hayes, VA
23072; Rob Thein, (804) 642-3484

Hobby Hangers Speedway, 14014 D
Sullyfield Cir., Chantilly, VA 20151;
Kwang or Billy, (703) 631-8820

The Hobby House, 116 Edds Ln.,
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KC's Radio Control & Repair, Rt. 4,
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Lynchburg, VA 24503; Curtis or Kim
Wright, (804) 384-8596

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Center St., Manassas, VA 22110;
Arnie Levine, (703) 369-1197

Roadmasters/Rick's Hobbies,
12201 Balls Ford Ave., Manassas,
VA 22110; Rick, (703) 330-6833

Shamrock Raceway, P.O. Box 3739,
Winchester, VA 22601; Kevin Allen,
(540) 662-0403

Thunder Road RC Racing, PO Box
1022, Troy, VA 22974-1022; James
Palmer, (804) 589-8174

Trackside Hobbies, 1920 E.
Pembroke Ave., Hampton, VA 23663;
Rick Cardwell, (757) 723-4170

Trainlano R/C Racing, 5661
Shoulders Hill Rd., Suffolk, VA 23435;
Frank Stevens, (757) 488-5454

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Allie's, 108 South K St., Aberdeen,
WA 98520; (360) 533-6638

A-Main Raceway, 14011 NE 3rd Ct.,
Vancouver, WA 98685; Monty
Coleman, (360) 571-8404

Burien Toyota R/C, 15025 1st Ave.,
South, Seattle, WA 98148; Ray
Meek, (800) 654-6456

C&C Raceway, 266 Lind Ave. NW
Renton, WA 98055; Charles Lakin,
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98506; Gary and Sharon Brown,
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Hale's R/C Raceway Park, 10611
136th St. E. Puyallup, WA 98374;
Walt Hale, (206) 845-7675

Hannegan Speedway, 4212
Hannegan Rd., Bellingham, WA
98225; Dana Hoggarth, (360) 734-
4090

Raceway Hobbies, 188 Sunset Ave.
S., Edmonds, WA 98020; Brian
Bodine, (206) 774-3285

Schmidt's Auto Parts, 10305 Old
Hwy. 99, Marysville, WA 98271; Jon
Failla, (206) 653-8838

Spokane Indoor Raceway, 6422 E.
2nd Ave., Spokane, WA 99212; Dave
Mapston, (509) 534-RACE

Tacoma R/C Raceway, 6305 6th Ave.,
Tacoma, WA 98406; Scott Brown,
(206) 565-1935

Tearor Raceway, Fantasy World Toy
and Hobby, 7901 S. Hosmer, Tacoma,
WA 98408; Dave Kleinman, (206) 473-
6223

Ultimate R/C Raceway, 907 Cole St.
#3, Enumclaw, WA 98022; Dan
Daugherty, (360) 802-2388

Zep's Hobbies & Raceway, 530
Interlake, Moses Lake, WA 98837;
Steve Ralph, (509) 765-8191

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Burr-Fab Raceway, 90 Davis St., West
Union, WV 26456; Mark Travis, (304)
873-2487

Fulton's R/C Raceway, 2646 Chapline
St., Wheeling, WV 26003; James
Fulton, (304) 233-5355

Left Turn Hobbies, 100 Saco Ln. (by
Post Office), Glen White, WV 25849;
Stretch, (304) 255-3930

Race Zone, Hopewell Rd., Rt. 8, Box
343A, Fairmont, WV 26554; Joe
Clutter, (304) 368-1000

WVRC R/C Club, 142 West Main,
Bridgeport, WV 26330; D.W. Weed

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Green Bay, WI 54304; Dan or Jay
Boettge, (414) 339-8288

Hobbytown USA, 2061 South Koeller,
Oshkosh, WI 54901; Hobbytown USA,
(414) 426-1840

JJ's Dirt Heaven, 6028 County Road
K, Champion, WI 54229; Jim or Jeff
Jansen, (414) 866-9096

Mid-West Tri-Clone, 3745 Shuster,
West Bend, WI 53095; Tom Holz,
(414) 334-0429

NARCAR Raceway, 4331 E. Wall St.,
Eagle River, WI 54521; Mary O'Brien,
(715) 479-5154

Pro-Star Racing, 726 Pine St., Green
Bay, WI 54301; Chuck, (414) 494-
1233 or Terry, (414) 469-5566

S&N's Trackside Hobbies and
Raceway, 6045 N. Green Bay Ave.,
Milwaukee, WI 53209; Scott Ernst,
(414) 351-1910

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Collectable Creations Off-Road Oval
Track, 1790 Dell Range Blvd.,
Cheyenne, WY 82009; Phil Severson,
(307) 632-2156

Wind River R/C Racing Association,
113 S. 3rd E., Riverton, WY 82501;
Bob Belding, (307) 857-2068

Xtreme Hobbies Raceway, 2724
Powder Basin, Gillette, WY 82718;
Krieg Balls, (307) 682-6077

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Club A. Velez Sarsfield, Av. J.B.
Justo 9000, C.P. 1408, Buenos Aires;
Jorge Herrero, 54-01-658-5851

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Justo 9000, C.P. 1408, Buenos Aires;
Jorge Herrero, 54-01-658-5851

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A.C.T. Model Car Racing Club,
offroad track—Wanniasa Raceway,
Hyland Place, Wanniasa A.C.T.;
indoor track—Epic Complex,
Northbourne Ave., Canberra North
A.C.T.; Gary Davey, 61-6-2871411

Aubry R/C Car Club, Aubry
Showgrounds, Aubry, NSW 2640; Ron
Langman, 060-247-128

Canberra Off-Road Model Car Club,
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Graham Brown, 61-6-241-3070

Central Coast ORRC, EDSACC Sports
Complex, Bateau bay, N.S.W. Australia
2261; Peter J. Knight, 61-43-693-698

Fast'n' Fun, 250 Potreath Rd Bellbrae
West, Torquay, VIC 3228 Australia;
Stephen Chara (03) 5266 1550 or
(03) 5266 1556; fax (03) 5266 1556

Illawarra RCECC, Croomie Sporting
Complex, Albion Park Rail, NSW 2527;
Mel or Andrew, 042-714-683

Lakeside R/C Racing Car Club,
Hollywood Dr., Lansvale, NSW 2166;
R. Bartolozzi, 62-2-907-9800

Melton Electric Circuit Car
Association, Saffery Car Parkm
Corner High St. and Coburns Rd.,
Melton, VIC 3337; Arthur Joslin, 61-
3-9747-8805

Northern Districts Model Rally Club,
Inc., Rear Stanford centre, 16
Stanford Way, Malaga, Western
Australia 6066; G. Thirlwell, 61 (9)
249 3855; fax 61 (9) 249 4778; email
tony@ois.com.au

Templestowe Flat Track Racers,
Templestowe Reserve, Corner of Porter
St. and Williams Rd., Templestowe,
Melbourne, Victoria 31066; Renato
Benci, 61 (3) 9553 4625

Wodonga R/C Car Club, 11 Murphy
St., Wodonga, VIC 3690; Ron
Langman, 61-60-247-128

BELGIUM

ATR-Alka-Tele-Racing, 3570
Stationstraat 21, Aiken Limburg;
0032-11-25-49-03

Cartroubles Indoor Buggy Track, Jan
Moonsstraat 52-56, 2160 Wommegem,
Belgium; Guy Erms, 32-3-326-31-61
51-15; fax, 32-3-326-51-01

M.B.V. Parc de Reist, Tenierstaal, 28.
B1910 Kampenhout, Belgium; Frank
Mostrey, fax 32-0-16657518

MBV-Kampenhout, Tenierstaal 28,
Kampenhout B1910, Belgium; Frank
Mostrey, phone and fax 0-16-65-75-18

MRCZ, Centrum, De Burg, Belgium;
Montie, 75-71-63

Model Racing Club Oudenaarde,
Scheldelant, 9700 Oudenaarde,
Belgium; A. Chanterle, 32-55-31-36-
48; fax, 32-55-30-19-12

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Guarinch, Brasilia, DF 70000, Brazil;
Alexandre (Alex), 55-061-273-7205

Hobby Center, SQS.210 Bl.H
Apt. 204, Brasilia, DF-Brasil 70.273;
061-242-0488

Jungle Drive, Rua Alberto Maranhao,
No. 219 Icha do Gov. Rio de Janeiro,
21940-490; Paulo Brito, (021) 396-
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Off Roaders, Av. Guillelme Dumont Villars, 317, Sao Paulo, CEP 05640, Waldir Ielpo, (055) 011-2605628; fax (055) 011-831-4931



Way of R/C Off-Road Cerrado, Rua Paraiba 1323, 1st floor, Belo Horizonte, Minas Gerais; Claudio T. Corrêa, (031) 227-6111, fax (031) 227-6869



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Action Wheelz, 462 Turcotte, Vanier, Quebec G1M 1R6; Regent Tardif, (418) 527-5756



Advance R/C Raceway, 4181 Sheppard Ave. E. Scarborough, Ontario M1S 1T3; Albert Lau, (446) 321-8377



A&J Toronto R/C Raceway, 24 Main St., Building B, Unionville, Ontario L3R 2E4; (905) 305-1479



ATN, Auto Teleguide Nicolet, 2000 Rue Paul Hubert, Saint-Jean-Baptiste-de-Nicolet, Quebec J3T 1E5; Louis Durand, (819) 293-6097



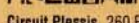
Auto Sprint, 6065 Des Grands Prairies, St. Leonard, Quebec H3G 2R6; David Kalayjian, (514) 287-3503



Circuit J.C., 1283 Chemin, St. Philippe, St. Polycarpe, Quebec J0P 1X0; Jean Castellon, (514) 267-7854



Circuit Pepsi, Centre de Location, 37 du Roi, Sorel, Quebec; (514) 746-8828



Circuit Plessis, 260 Rang 9 Ouest, Plessisville, Quebec G6L-2Y2; (819) 362-3743



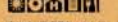
Circuit R/C Pro, 1500 Chemin Sullivan, Val d'Or, Quebec, J9P 1M1; R/C Modeler Plus, (819) 874-3918



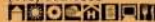
Circuit Teleguide St. Roch, 363-B St. Charles, St. Roch De L'achigan, Quebec J0K 3H0; (514) 588-4254, fax (514) 588-6554



Club Avatt, 244 Jules-Richard, Deauville, Quebec J1N 3; Daniel Vanier, (819) 864-6262



Club RC51, 44 Rue Holliday, Sept-Îles, Quebec G4R; Sylvio Gerard, (418) 968-6575; Hobby Shop, (418) 962-6565



CRCCC, Box 309, Clinton, Ontario N0M 1L0; Eric Russell, (519) 482-9429



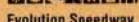
Dustkickers R/C Raceway, 1785 Cypress Rd., Quesnel, British Columbia V2J 4B1; Darrell Dinsdale, (250) 747-2680



Dynamic Hobbies, 21 Concourse Gate, Unit 6, Nepean, Ontario, K2E7S4; Clark Freeman, (613) 225-9634



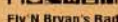
East Coast Model Center Raceway, 13 Glen Stewart Dr., Suite 1, Southport, Prince Edward Island C1A 8X9; Gary Stephen, (902) 569-3262



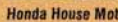
Evolution Speedway, 1935 Glengrove Rd., Pickering, Ontario L1V 1X3; Eric Lang, (905) 839-2084



Fast-Trax Speedway, RR 4, Trenton, Ontario; Russ McPeak, (613) 394-6411



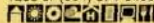
Fly 'N' Bryan's Radical Raceway & Little Shop of Hobbies, RR #1, Site 12, Comp. 49, Chase, British Columbia, Canada V0E 1M0; Bryan Coffey/Dani Potvin, (604) 955-0669



Honda House Motor Speedway, 384 Richmond St., Chatham, Ontario N7M 1P9; John Elliot, (519) 354-5530



Interior R/C Raceway, 34-1605 Summit Dr., Kamloops, BC, V2E 2A5; Martin Vannieuwenhuizen, (604) 374-1268 or (604) 374-8458



J-T International Raceway, 127 Milligan Lane, Nanaimo, Ontario K7R 8A1; N. O'Neill, (613) 354-0099



Leading Edge R/C Speedway, 731 Gardiners Rd., Kingston, Ontario K7M 3Y5, Canada; Mike and Tony Daicar, (613) 389-4878



Mid-Canada R/C Speedway, 1678 St. James St., Winnipeg, Manitoba R3H 0L3; Richard Driedger, (204) 339-6566



Minatures & Passions, 204 St. Charles, #103, Ste. Therese, Quebec, Canada J7E 2 B4; Gilles Lachance, (514) 979-7989



MORRAC Raceway, 5449 Crowchild Tr. SW., Box 36060, Calgary, Alberta T3E 7C8; (403) 254-1386



Off-Road R/C Raceway, 76 Eddystone Ave., North York, Ontario M3N-1H4; Ron Lefebvre, (416) 740-0536



Prince George Radio Controlled Car Club, 202 Explorer Cres., Prince George, B.C. Y2M5R8; Doug Waller, (604) 561-0035



Quintrax Speedway, 610 Dundas St. East, Belleville, Ontario K7K 2M1; (613) 962-1414; fax (613) 962-7306



Randy Shantz Raceway, 1015 W. 14th St., North Vancouver, British Columbia; Steve Muihlh, (604) 945-3888



R/C Champ Raceway, 670 Progress Ave., Rear Unit #13-16; Scarborough, Ontario, M1H 3A4; Ben, Matthew or Louie (416) 289-8717



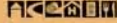
RC World, 7070 Haldibrook Rd., RR #1, Caledonia, Ontario N3W 2G8; Don Nicholls, (905) 679-3177 or Keith Seguin, (905) 388-9855



Recreation R/C Raceway, Hwy 16 and Ferry Ave., Prince George, BC; Doug Waller, (604) 561-0035



Ronbo's R/C Racing, RR 1 Glen Walter, Cornwall, Ontario K6H 3G4; Ron Giroux, (613) 936-0176



Rousillon Hobby Track, 177-D St-Jean Baptiste, Chateaugay, Quebec J6K 3B4; (514) 698-2151



Sheldon's Raceway, Box 597, Cutknife, Saskatchewan; Sheldon Bradlow, 398-2232



Spinnin Wheel Raceway, RR 1, Ariss, Ontario N0B 1B0; (519) 824-1614



South Okanagan Roadhogs, Skha Lake Rd., Penticton, BC; Willie Lemmi, (604) 492-5698



Steeltown Speedway, 3580 Kirk Road West, Binbrook, Ontario L0R 1C0; Paul Snyder, (905) 227-7508



Strathclair Park, Old Garden River Rd., Sault Ste. Marie, Ontario P6A 5T1; (705) 759-1855



Sudbury Organized Auto Racing, 765 Barrydowne Rd., Sudbury, Ontario P3A 3T6; Ken Moore, (705) 524-5339



Thunder Alley Raceway, Lambton Mall, 1380 London Rd., Sarnia, Ontario N7S 1P8; Rob Smith, (519) 882-3361



Vancouver R/C Road Racers, #100-2733 Barney Hwy., Coquitlam, British Columbia V3E1K9; Roger Brown, (604) 945-3888

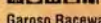


COLOMBIA

Club De Automodelismo Colombiano, Centro Recreativo Catam, Kilometro 14 Autopista Norte, Santafe De Bogota, D.C. Colombia; Jorge Delgado, 1-6130588



Club De Automodelismo Colombiano, Centro Comercial Guaymaral, Kilometro 16 Autopista Norte, Santafe De Bogota, D.C. Colombia; Jorge Delgado, 1-6130588



Garoso Raceway, Avenida Libertadores con Diagonal Gran Colombia, Cucuta, Colombia; Gabriel Rodriguez, 975-751892



CYPRUS

Racing Model Club, Kennedy Ave. N. 42, Nicosia, Cyprus; Andrea Sotiriou, 493186; fax 493229



DENMARK

Brøndby Motor Club, Roskildevej 460 Brøndby, Denmark 2605; Søren Boy Holst, 45-36-472-462



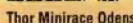
Holstebro R/C Buggy Club, Mozartsvej 7500 Holstebro, Denmark 2600; Michael Brusholt, 45-97-412-734



Klub 144 Raceway, Bagsvaerdvej 144A, 2800 Lyngby, Denmark; Henrik Carstens, 45-42-88-3691



Rainbow Raceway, Eriksvej, 9 Glostrup, Copenhagen 2600; P. Christiansen, 45-52-848-504

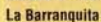


Thor Minirace Odense, Sohussvej 255, Aliso, Odense, Behind Alesso Hallen (Sport Centre), Odense, Denmark; Ulrich Rasmussen, 45-65-303-707

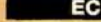


DOMINICAN REP.

Adoca R/C Speedway, Feria ganadera, Santo Domingo; (809) 220-5266



La Barranquita R/C International Speedway, Santiago; (809) 582-2303



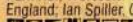
ECUADOR

Hobby Centro A.C.R.O. Club, Via a Turi Km 0.5, Cuenca-Ecuador; Teddy Jaramillo, 593-7-831-289; fax 593-7-817082

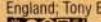


ENGLAND

Chessington Radio Car Club, Surbiton Sport Club, Riverhill Estate, Worcester Park Rd., Worcester Park, Surrey, England; Ian Spiller, 0252-20657



Hampshire Racing Center, Viables Craft Center, Basingstoke, Hampshire, England; Tony Eudola 44-1276-61402



Hinckley RCCC, Three Pots Inn, A5 Watling St., Hinckley, Leicestershire, UK; Bruce, 01455-890580



FRANCE

Auto Model Club de l'Ouest, 45 rue de Menez Lojerhet, France 29470; Peuziat Michel, 02-98071764



Auto Electron, 35, rue B. de Ventadour, Limoges, France 87000; M. Boudoul, 55 062763



Crame Roncq, 64 rue du Becquerel, 59370 Mons el Baroeul, France; Michael Hondekyn, 33-20042755



Lorgies Bolides, rue Beau-Riuz, 62840 Lorgies, France; Mme. Hourdequin Sabine



GERMANY

Dreykon Raceway, Heuchlinger-Hauptstr. 43, Lauf 91207; Hermann Hensel, 09123-81457



INDONESIA

Cipaku Indah Speedway, Jl Cipaku Indah II/2, Bandung 40143, Indonesia; Cipaku Indah Hotel, Brad Lake, 62-22-210219



Everly's Racing, Palm St., 188, Surabaya, Jatim, Indonesia; Jhon Mudik 62-31-595-888



Badan Pangelola Karinda Circuit, Kompleks Rukan Buncit Mas Blok CC-6 Jl. Mampang Parapatan Raya 108, Jakarta-Selatan, Indonesia, 12760; Wiwied W. Soedarmadi, 62-21-7900878; fax 62-21-7946431



Pondok Cabecircuit, J.L. Kunir No. 83, Pondok Cabe, Ciputat, Jakarta, Indonesia; Ali Agus Salim, 7403568-9; fax 7491533

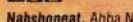


Sentul World Hobbies, Citeureup Bogor Jawa Barat, Indonesia; International Circuit Hilton Hartanto, Ian Sentul International Sirkuit, KM 42 62-21-751-2439



ISRAEL

Ircra Off-Road, Rahanana, Israel; Yaron Zafris, (972) 030549937

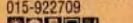


Nahshoneat, Abba Nilel Silver Str. 64, Haifa, Israel 32809; Golan Levy, (972) 039386444 or (972) 04231252



ITALY

Associazione Modellisti Cossato, via P. Maffei, Cossato 13014, Biella, Italy; Zanellato Romildo, 015-405881; fax 015-922709



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Foster R/C Raceway, Camp S.D. Butler, Okinawa, Japan, FPO AP 96379; Camp Foster Arts & Crafts, 81-61173-53674

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Racer of the Month

When he started racing last September, John Tyndall of Mechanicsville, VA, had owned his first electric R/C car—a Bolink Legends stock car—for just two days. Racing against some of the local pros, John was able to nail down a second place overall finish at his first series of races at Bob's Hobbies indoor, concrete tri-oval last fall and was given the Best Rookie Driver Award. He finished in first place after this winter's eight-race series and was awarded a plaque.

After two successful seasons, John has moved from the Legends classes to Super Truck and now runs a Chevy Super Truck in the Adult Novice classes. Like the three 10-year-olds who showed up at the Cactus Classic and swept up the infield in the Stock Truck A-Main, John has a potentially long and prosperous future in R/C ahead of him. Good luck!

Wanna be like John? Send a photo of yourself and your car or truck and tell us where YOU race. Enclose a brief bio of yourself, a summary of your racing career and info on your track (it must be listed in the Track Directory), and we'll try to make you famous! If you're randomly picked, we'll run your photo in the Track Directory, and you'll win your choice of \$250 worth of Pro-Line, Protoform and Jaco products from the 1997 catalogue. Send entries, including address and phone number, to "Racer of the Month," c/o Pro-Line Racing, P.O. Box 456, Beaumont, CA 92223.



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EDITORIAL Send correspondence to Editors, Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. We welcome all editorial submissions, but assume no responsibility for the loss or damage of unsolicited material. To authors, photographers and people featured in this maga-

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My engine's better than your engine.



Ah, yes, my children, an age-old argument indeed. I know it all too well and, at times, still join in on the babyish battle but end it all by adding my own, "Is, too!—infinity!" Listen, there's nothing wrong with reverting back to being a 6-year-old—I go there often—if, and that's a big "if," you have the facts. Too many of you are giving your glow engines peak horsepower rating way too much value; in fact, it's next to value-less. The peak hp rating is reached in a lab with the engine hooked up to a dynamometer and surrounded by a bunch of white-coated geeks wearing horn-rimmed glasses and holding clipboards. This "controlled" environment has nothing in common with the realities of summer running on a dusty, twisting off-road or on-road course. I won't get into test-parameter disparities among manufacturers or dwell on their single-minded determination to find ways to push the test engine to the limit so that they can print the highest hp value obtainable. Let me ask you readers one simple question: Do

you think, for one minute, that the manufacturers aren't aware you guys are out there saying, "My engine specs say 3.47hp." "Oh, yea; well the specs for my newer model state 3.489hp—so there!"



To tailor your engine's powerband, it's great to have tuned pipes in a variety of lengths, but these little, and relatively inexpensive, machined-aluminum inserts are also super devices. The insert fits into the carburetor, thereby decreasing the venturi's inside diameter. Yes, this decreases peak hp, but who cares?! It works wonders at broadening the powerband and making a racer vastly more driveable in all situations. Trust me; the guys in the know use them. Oh, yea, I almost forgot: the decreased venturi diameter increases air intake velocity, and that increases fuel-draw, which improves throttle response and gives a more reliable idle. Sounds like a performance bargain to me! Inserts are available from Dynamite* (shown), Associated* and MIP*.

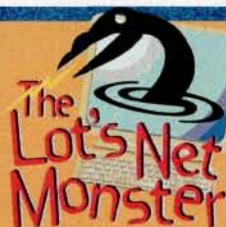
This is my page—mine!

The opinions expressed on this page do not necessarily represent the opinions of the entire Car Action staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. My internet address is: chris@airage.com.

Look, forget the specs. As racers who accelerate and decelerate on a course with curves (not a drag race), we need to focus on *usable power*. Here's an example: back in the early '80s I rode a friend's 3-cylinder Kawasaki 500 2-stroke that boasted all kinds of speed and power. Understand that Kawasaki makes awesome bikes today, but in my opinion, this thing from the '70s was a useless piece of crap. Why? The engine was a total dog until it hit its very narrow power-

band (torque band) where all of the hp would suddenly come on somewhere between 7,000 and 7,500rpm. I was literally "ambushed" by this obnoxious surge of power. If I wasn't ready for it, the handlebars could and would hit me in the teeth—it was that violent a burst. This is where the term "super-peaky" comes from. This bike was so peaky that it was very difficult to drive. Imagine trying to play the throttle on a sweeper and having this level of peakiness to contend with; and what if I wasn't right in that narrow powerband coming out of a hairpin. Forget it!—no punch at all; everybody passed me. The same is true with an R/C gas car. So a lot of good that "peak" hp rating is going to do you!

Usable hp comes with a reasonably broad powerband. This means power that is spread over a wide range of rpm—not all stuffed within a narrow 500rpm range. It's power that's there for the asking in the infinite number of situations the racetrack will throw at you.



**A view from the
brilliance ever present
on the Internet**

Chris,
You have got to be the coolest person at Car Action. I sent you an email about the secret to winning ad and complained about it being bull*%\$# and you responded. I can't believe you responded cause I really didn't think you had the time to do that, as you must get millions of letters. Anyway, I really think highly of you and your crew and it's the only mag I subscribe to and keep every issue of. I wish we had the sup-

port and the amount of activity that you have in the States (I'm writing from Victoria, British Columbia, Canada, and our local hobby store doesn't even carry R/C Car Action). Anyway, keep up the good work. One more question: can you start a column called "The gorgeous women of R/C, as chosen by Luna"? See ya on the back page, eh!!!!
Kent Brockman (alias John McNaughton): jbdc@bc1.com

Kent,
You're confusing "coolest" with "craziest." In truth, we have a totally cool crew here. I'll confer with Luna as to your request. Thanks man ... from me and Luna. CC

P.S. I told Doogie that if he practices diligently till the return of Hale-Bopp, he'll be almost as cool as me.

Chris,
I was reading my R/C Car Action, and your "Back Lot" caught my eye. Man, were you right on that sore losers column. That was just what I wanted to hear. My friend and I went racing a few days ago and came in 5th and 6th. Now, I know that isn't something to brag about, but one person we beat came up to me and looked at my truck. Then he asked me how could I hide my tricks so good. I had no idea what he was talking about; then he told me how he thought I cheated. He just wouldn't give it up until we left. I hope that kid reads your column and thinks hard about it.
Thanks.
Curt T2racer2@aol.com

Curt,
The guy is a pantywaist; not your problem. Have fun Kick butt. CC